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Industrial Health, Occupational Medicine and Traumatic Surgery

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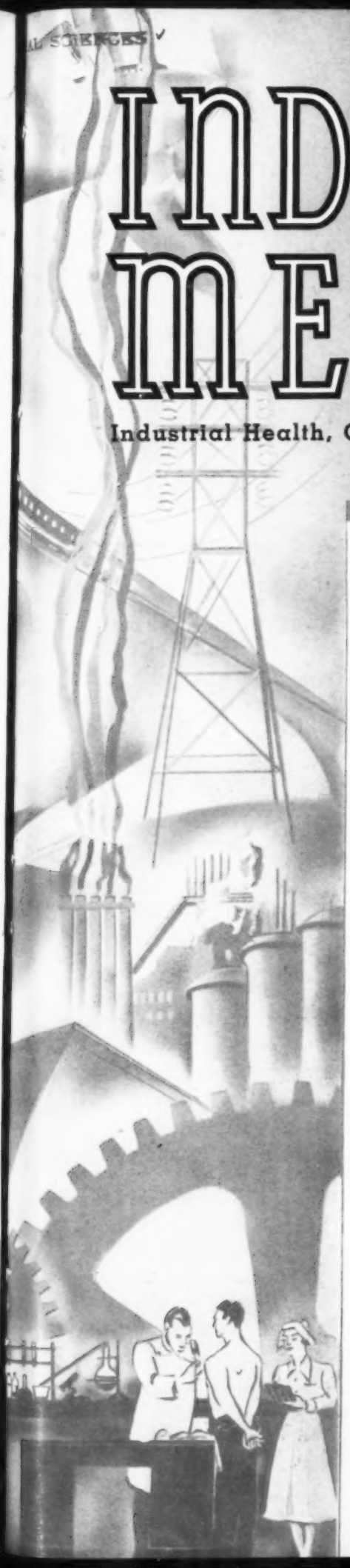


June, 1945

Aluminum Therapy in Silicosis
— Clinical Study of the Metallic Powder and Hydrated Alumina —

Modern Concept of Psychiatry
— In Industrial Medicine: In the Medical School —

Abdominal Wounds and Injuries
— Principles of Treatment —

Industrial Medicine and Surgery
— An Economic Interpretation —

Methyl Bromide Intoxication
— Of a Large Group of Workers —

Skin Hazards
— From Cashew Nut Shell Liquid Formaldehyde Resins —

Back Saving
—Home Care and Personal Conduct —

Quinine
— In the Treatment of Respiratory Infections —

Industrial Health
— Increasing Importance in Industrial Relations —

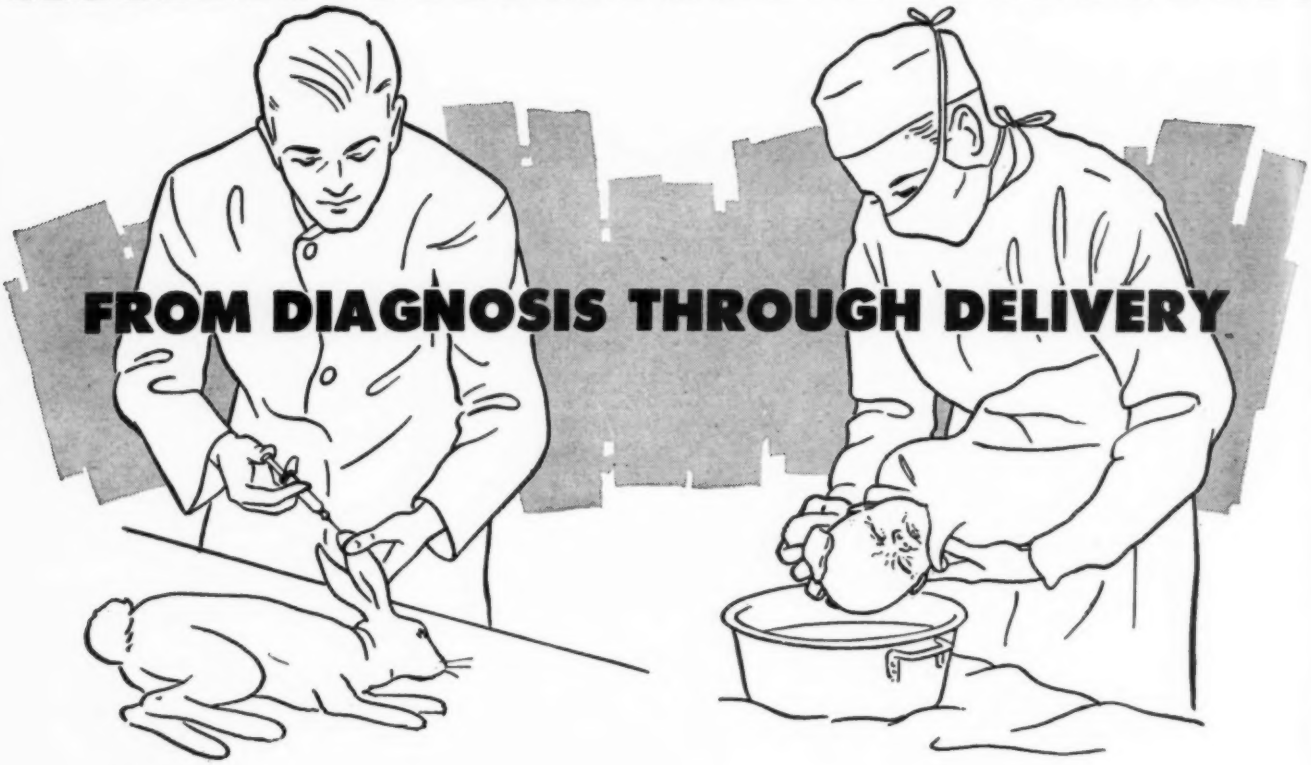
National Medical Care
— A Plea for an Ethical "Package Plan" —

Pre-Placement Physical Examinations
— Recent Developments —

The Value of a Medical Service
— In a Small Industrial Plant —

Volume 14 *Number 6*

Number 1 of a Series



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DR. BAMBERGER, in his important study of "Aluminum Therapy in Silicosis" (page 477), indicates that hydrated aluminum seems to be superior to the metallic powder but points out, as a true scientist should, that the optimum dosage of neither form of aluminum has as yet been established. . . . DR. GIBERSON, in her "Modern Concept of Psychiatry in Industrial Medicine" (page 480), emphasizes (1) that the frailest link in the production which is the goal of business is the human being, and (2) that industrial psychiatry, while it is "a form of preventive industrial medicine," is not and never can be an exact science. She prefers to think of it as an "emotional first aid station". . . . DR. POTTER (page 481), although disclaiming any knowledge of industry, nevertheless summarizes the place of psychiatry very well: "I do know that industry in the final analysis is comprised of a group of people trying to do something about something. As a psychiatrist, I know the biggest job of any human being is to adapt himself to other human beings and to authority, whether it is the authority of someone else, the authority of the social order or the group, the authority inherent in the job itself, or the authority he has over others. Psychiatry has much that is basic to offer in the whole area of group relationships as well as a technic for identifying and aiding the insecure and conflicted worker and executive. . . . Within the confines of the medical department of any industrial organization, the same people are seen and treated as are seen in any doctor's office, hospital or clinic. Other things being equal, how does it happen that some workers are accident prone? Why do some workers have an unduly prolonged convalescence from illness or injury? What about all those workers who suffer from physical symptoms in

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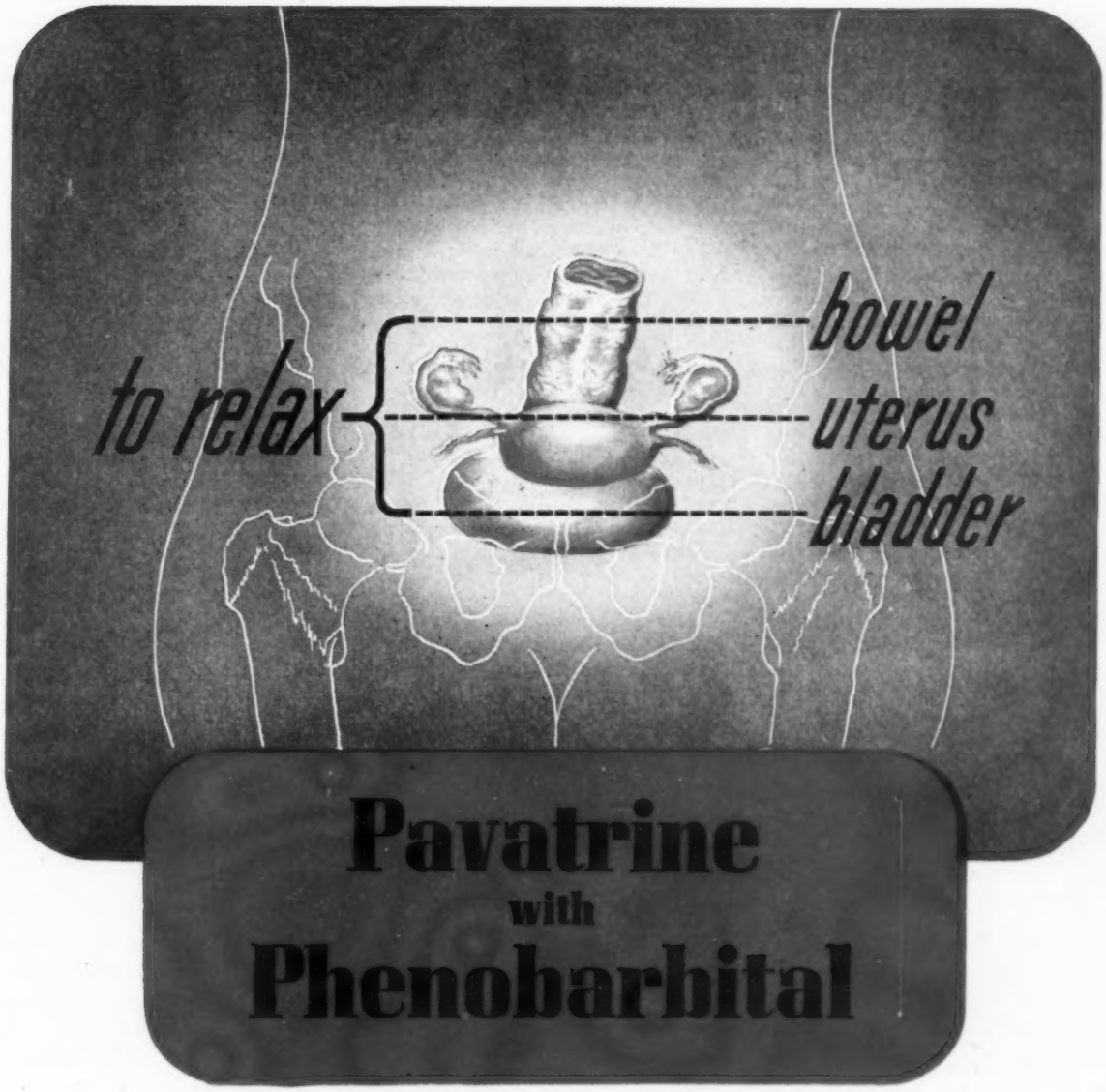

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RESEARCH IN THE SERVICE OF MEDICINE

—*Continued from page 3.*

the absence of any demonstrable organic pathology? Persons with accident proneness, delayed convalescence and functional disorders are familiar figures in a psychiatric practice, and many are cured or materially improved when properly and adequately dealt with and treated." The proper and adequate treatment, however, can't be summoned from a shelf or taken out of a bottle. Nor does the ability to apply it derive from a degree or title. As we noted last month, "In the words of one of the country's really outstanding industrial psychiatrists, 'this department of industrial medicine as an enterprise is slogging hard work.' Whatever the scope of the psychiatric problem as it presents itself in employed people, the solution does not lie in theories but in 'hard conscientious research,' the compiling and study of available data and tried procedures, and more hard work. A very great deal of this kind of preparation should underlie any professional right to say, especially in matters of psychiatry, 'I am the Doctor'". . . . COLONEL PARSONS' brilliant article on "Abdominal Wounds and Injuries" (page 483) should be carefully read for true appreciation by industrial surgeons. The discussions of DRS. SLOBE and HOLMBLAD are particularly enlightening: and the case report by DR. SLOBE (page 487) is most unusual and very interesting. . . . AS CHAIRMAN of the A.A.I.P. & S. Committee on Medical Care Insurance Plans, DR. HAMMOND (page 489) presents the facts and figures of a strong argument toward prompt and efficient action for an ethical "package" for coverage of national scope . . . The practical minded employer asks, Why can't we have a single program?". . . . CASE HISTORY reports and experiences on methyl bromide poisoning are so infrequent that DR. JOHNSTONE'S "Methyl Bromide Intoxication of a Large Group of Workers" (page 495) brings a unique and arresting example of "group poisoning" to these pages. Outstanding in interest are the "delayed reaction," the ignoring of sane preventive measures by the human factor, and the lack of permanent disability in the majority of the cases. . . . DR. SCHWARTZ and his associates (page 500) submit new and interesting scientific evidence on dermatoses resulting from contact with cashew nut shell liquid formaldehyde resins, both in manufacture and use, thus combining an industrial and public relations problem. The conclusion is reached that the incidence of industrial dermatoses is no greater in the plant surveyed than is found in other industries making other types of phenol-formaldehyde resins. . . . SIMPLICITY and directness are the keynotes of DR. HELLER'S presentation on "Back Saving—An Outline of Home Care and Personal Conduct" (page 508). This, developed from long experience and directed to "the man with the hoe," is nicely adapted to publication and repetition by industrial physicians in their doctor-patient relationships. As a suggestion toward that end, show it to the editor of the company's employee magazine. . . . THE OPEN-MINDED can no longer doubt the significance of labor's interest and growing participation in programs designed to conserve the health of employees, as so ably set forth in MR. AHEARN'S "Increasing Importance of Industrial Health in Industrial Relations" (page 510). Although management is clearly responsible, labor cannot accept privileges without active cooperation. . . .

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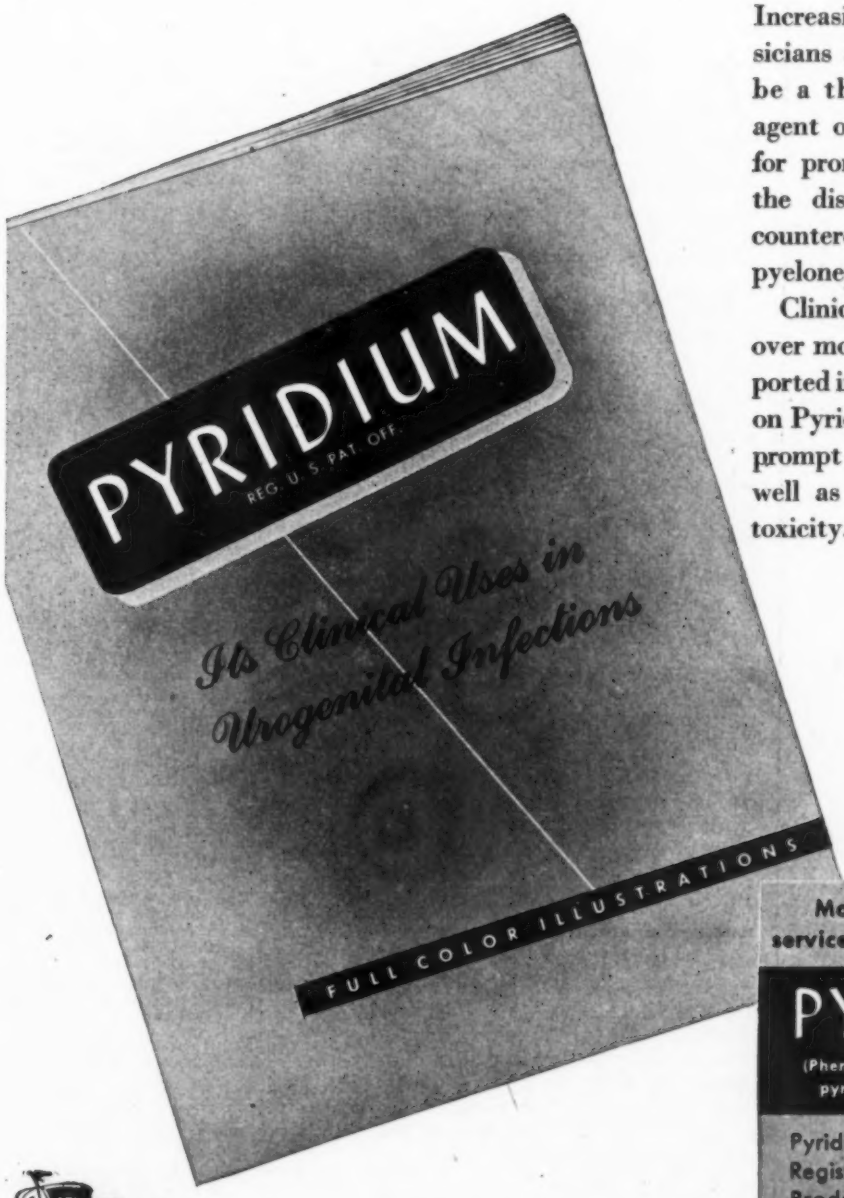

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PERSONAL

DR. RONALD E. LANE, who has been lecturer in factory hygiene and lecturer in medicine at the University of Manchester, England, has been appointed to a new chair of industrial health, which was created recently by the Nuffield Foundation under a grant of £70,000. According to *Science*, DR. LANE is expected to take up his new work next September.

DR. SAMUEL M. PECK, for some time Senior Surgeon, Bureau of State Services, U. S. Public Health Service, has returned to private practice and is now organizing a division of industrial dermatologic research at the Skin & Cancer Unit of the Post-Graduate Medical School, Columbia University.

DR. LOUIS J. SPOLYAR, head of the industrial hygiene division of the Indiana State Board of Health, spoke on "Industrial Dermatitis and Other Industrial Hazards," at a meeting of the Howard County Medical society held May 4, with DR. THOMAS M. CONLEY presiding. Representatives of the safety and personnel departments of various local factories were present as invited guests. This was a most timely subject as there have been many cases of skin disorder among the industrial workers throughout the country. Methods of prevention and treatment were outlined and illustrations shown.

—*Kokomo Tribune*, May 5, 1945.

DR. JOHN F. KENNEY, Pawtucket, Rhode Island, has been installed as president of the NEW ENGLAND CONFERENCE OF INDUSTRIAL PHYSICIANS, succeeding DR. DANIEL L. LYNCH, Boston. DR. THOMAS P. KENDRICK, Boston, is the president-elect.

DR. C. F. N. SCHRAM, since March 1, 1934, Medical Director, Tennessee Eastman Corporation, Kingsport, Tennessee, died suddenly May 22, 1945. DR. SCHRAM was born at Flint, Michigan, April 13, 1884, graduated M.D. at Columbia University College of Physicians and Surgeons in 1916, and interned at White Plains Hospital, White Plains, New York, 1916-17. His whole career as a physician and surgeon has been in industrial medicine. He became chief surgeon for Fairbanks, Morse & Company at Beloit, Wisconsin, in 1917, and continued there until he went to the Tennessee Eastman Corporation 17 years later. In addition to his state and county medical society activities, he was always deeply interested in the AMERICAN ASSOCIATION OF INDUS-

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TRIAL PHYSICIANS AND SURGEONS; he was president of that organization 1929-30, and served several terms as director. At Fairbanks, Morse & Company, he instituted a comprehensive program of health and hospital care for the employees and developed a plant medical department which early received approval by the Amercian College of Surgeons. He was the author of numerous important and interesting articles on various phases of industrial medicine, and his personal interests included many civic and public movements. He was particularly interested in the conservation of natural resources. While at Beloit he was for 10 years secretary of the Izaak Walton League and a leader in the conservation program of that organization. He was also interested and active in his church. He will be greatly missed.

GENERAL

Western Association

IN COMPLIANCE with the request of the ODT, the annual convention of the WESTERN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS was postponed this year. However, the officers of the Association met at the Biltmore Hotel in Los Angeles on Saturday, May 5, along with the chairmen of the various committees of the organization. Detailed reports were presented by each chairman regarding the work of his committee. The Committee on Legislation and Public Relations under DR. R. S. KNEESHAW was particularly active during the year, as were the Committee on Rehabilitation under DR. CLIFFORD KUH, the Committee of Medical Economics under DR. A. C. DICK, and the Committee on Standardization of Records and Industrial Accident Reports under DR. BEN FREES. Twenty-seven new members were enrolled this year, a number of these being from states on the west coast other than California, which indicates the future influence of this Association. DR. RICHARD O. SCHOFIELD succeeded DR. RUTHERFORD T. JOHNSTONE as President, the lat-

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ter becoming Chairman of the Board of Directors. DR. JOHN D. BALL became the new Vice-President, and DR. A. C. DICK became a member of the Board of Directors.

A.A.I.P. & S. Meeting

THE Annual Meeting of the members of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS is being held at the Association offices, Room 1300, 28 East Jackson Boulevard, Chicago, Illinois, on June 22, 1945, at 6:00 o'clock P.M.: (1) to elect directors and officers of the Association for the ensuing year; (2) to vote upon the adoption of a new set of By-laws of the Association in substitution for the present Constitution and By-laws (the proposed By-laws are printed in full in the May, 1945, issue of INDUSTRIAL MEDICINE); (3) to vote upon the creation of a trust or corporation, as determined by the President, Managing Director, and President-Elect, for educational and charitable purposes in connection with industrial and occupational medicine research and education and in respect of industrial and occupational medical services; (4) to vote upon a $500 contribution to such trust or corporation; and (5) to transact such other business as may come before the meeting.

New England Conference

PHYSICIANS prominent in several fields of industrial health and medical care spoke to the NEW ENGLAND CONFERENCE of the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS at its meeting May 2 in the recreation hall of the J. & P. Coats (R. I.) Inc., Pawtucket. About 90 persons, including medical directors of plants throughout New England and nurses employed by industries in the Rhode Island area, were welcomed to the meeting by J. COLBY LEWIS, vice-president and general manager of the Coats plant. Among the speakers were: DR. JOHN E. DONLEY, chief of neurology at Memorial Hospital, who told of the new Rhode Island Curative Center in Providence, the first in the country specifically designed to treat persons injured in industry: DR. U. E. ZAMBARANO, superintendent of Wallum Lake Sanatorium, who explained the desirability of x-ray projects in industrial plants to detect tuberculosis; DR. VINCENT J. RYAN, dermatologist at Rhode Island and Memorial Hospitals and consultant at several

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plants, who talked about skin disorder and suggested treatments; and DR. HENRY B. MOOR, chief surgeon at Memorial Hospital and medical director of Gorham Manufacturing Company, who spoke on burns and their treatment. DR. DANIEL LYNCH, medical director, the New England Telephone and Telegraph Company, led a general group discussion.

—*Providence, Rhode Island, Bulletin,* May 2, 1945.

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TO provide an organization, not for pecuniary profit, in which all agencies and societies, both medical and lay, concerned with the problems of industrial health can hold membership and can meet together in conference for the study, discussion and careful consideration of all industrial health problems and procedure; to engage in scientific research to determine the cause, nature, prevention and cure of diseases and injuries of occupations; to assist in establishing and supervising industrial health clinics to serve small industries; to establish and maintain hospitals which will furnish facilities for the care, treatment and study of occupational injuries and diseases; to make surveys of industrial medical services and recommendations for their improvement; to solicit, receive and administer funds for any purpose that will advance and/or improve industrial health; to establish undergraduate and/or post-graduate courses in industrial medicine and surgery and/or to cooperate with medical schools and industries in maintaining such courses; and to use all those means, which from time to time, may seem wise, for the advancement of industrial health.

AVERAGE MEASUREMENTS OF BOYS' AND GIRLS' HEIGHT IN INCHES

Age	Boys	Girls
Birth	20.2	19.9
3 months	24.1	23.7
6 months	26.4	26.0
12 months	29.5	29.0
18 months	31.9	31.4
2 years	33.9	33.4
3 years	37.3	36.7
4 years	40.2	39.6
5 years	42.7	42.2
6 years	45.0	44.6
7 years	47.2	46.8
8 years	49.2	48.9
9 years	51.2	50.9
10 years	53.2	53.0
11 years	55.2	55.3
12 years	57.1	57.6
13 years	58.9	59.7
14 years	60.7	61.4
15 years	62.4	62.5
16 years	64.0	63.2
17 years	65.4	63.7
18 years	66.6	64.0
19 years	67.5	64.0
20 years	68.0	64.0

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Boys and girls grow more than an inch a year from their sixth to their twentieth birthdays. But too often children lack the vitamins needed to chalk up this gain since even essential vitamins A and D are often omitted after infancy.

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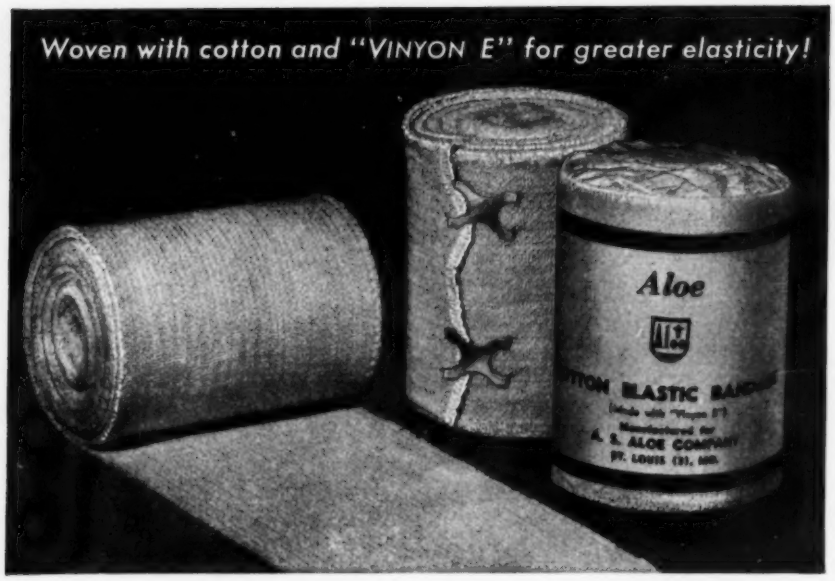

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Aloe cotton elastic bandages are woven of long staple cotton and "VINYON E"—a vinyl resin yarn—which has been found to produce a superior type of elastic bandage because of its natural elasticity. These improved elastic bandages will provide even, uniform, easily controlled and steadily maintained pressure in all conditions where an elastic bandage is indicated. High quality feather-edge prevents binding. Special weave permits free movement, ventilation and circulation. Unlike most other elastic bandages, Aloe cotton elastic bandages with "VINYON E" do not have to be washed daily in order to retain their elasticity. Washing need only be done when bandage becomes soiled. Each size bandage listed below measures approximately 5½ yards when stretched and is furnished with two metal clips in cellophane wrapped and sealed package.

	Each	Per Doz.
HH5934—Aloe Cotton Elastic Bandage with "VINYON E," 2-inch width	$0.63	$ 6.30
HH5935—Same, 2½-inch width	.76	7.65
HH5936—Same, 3-inch width	.85	8.55
HH5937—Same, 4-inch width	1.12	11.25

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NEW YORK Academy of Medicine's Committee on Medicine and the changing order has created a subcommittee on industrial medicine to which DRS. ANTHONY J. LANZA and THOMAS D. DUBLIN have been named. The subcommittee's purpose is to advance certain recommendations as to the developments that are indicated in the immediate future in the field of industrial health.

Gum Helps

ACCORDING to DR. FRANCIS HENRY MCGOVERN, of Danville, Virginia, the use of the chewing gum containing sulfathiazole after removal of the tonsils, seems to have lessened the number of cases of secondary hemorrhage. It seems that the chewing keeps the muscles limber, lessens the difficulty in swallowing and hastens the healing. It is best for the patient to lie down with the head lower than the shoulders when the gum is chewed. This will allow the sulfathiazole to reach the tonsils or area in the back of the throat.

—DR. HERMAN N. BUNDESON, in *Chicago Herald-American*, June 4, 1945.

Mass Control of Dental Caries

IT HAS been suggested that a number of communities add fluoride to their water supplies under controlled conditions. The Newburgh-Kingston demonstration appears to be thoughtfully planned and is to be carefully controlled. Newburgh, a city of approximately 30,000 population, located on the Hudson River, already has about 0.12 p.p.m. of fluorine in its domestic water. Approximately 0.8 p.p.m. is to be added in the form of sodium fluoride. Kingston, a city of similar size with comparable water supply, population group, climatic conditions, economic status, and source of common food supply, is to serve as the control area. The city of Kingston is now, and is to remain, essentially fluorine free. All five to 14 year old children in the schools of Newburgh and Kingston are to have dental examinations annually. A representative group of children in the study area will have complete physical examinations periodically.

—*Nutrition Reviews*, 3:4, 117, April, 1945.

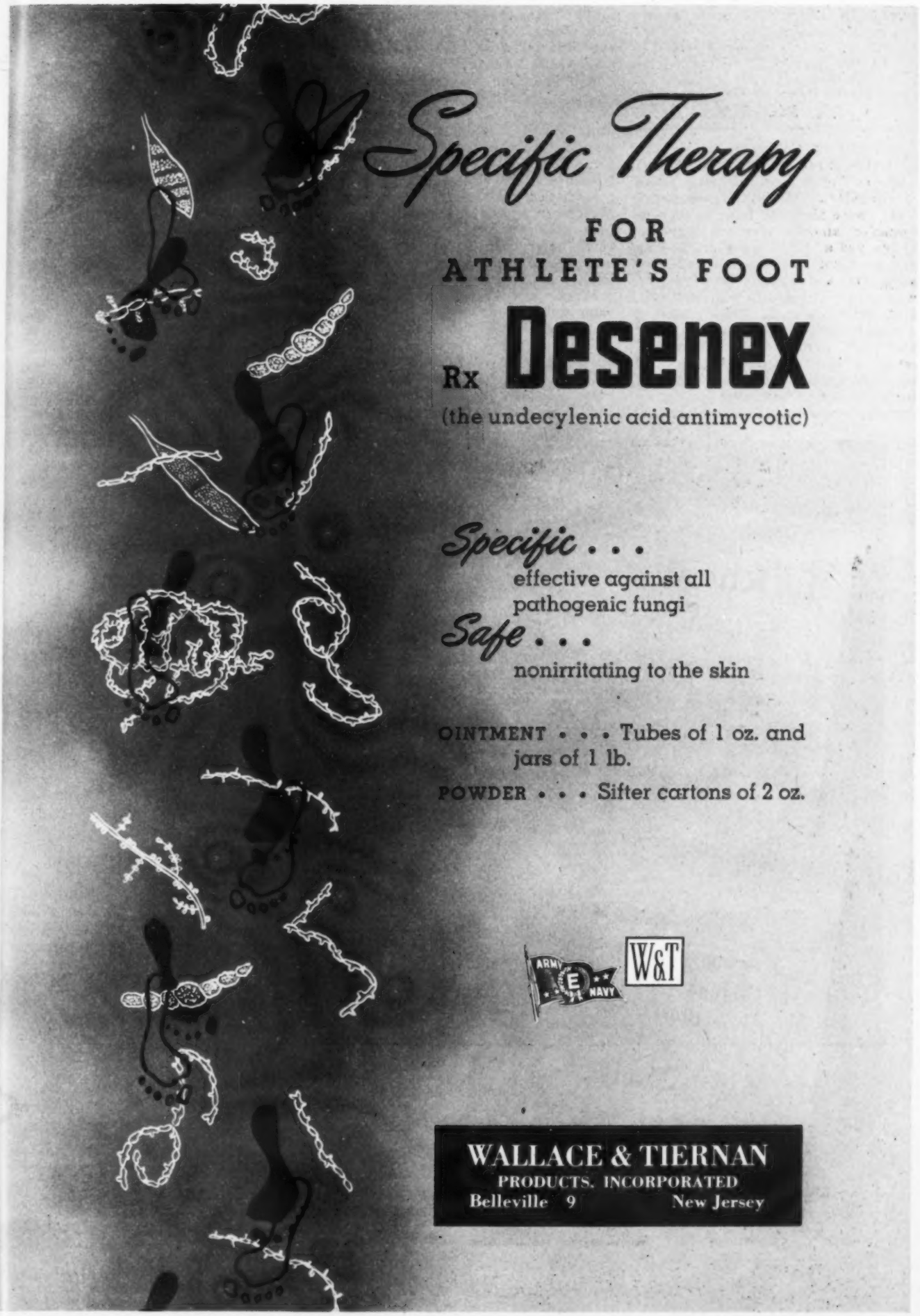
Nurse Draft Abandoned

THE army abandoned its fight for a nurse draft law today (May 26) conceding that the end of German resistance and increased recruitment of nurses had eliminated the need. Acting Secretary of War Patterson suggested that the senate drop further action on the controversial bill, and Sen. Thomas (D., Utah) jumped to comply. 'It seems to me this is a most satisfactory disposition of the difficult problem," the military affairs committee chairman said. "The most extreme emergency measure of the war has solved itself." Sen. Johnson (D., Colo.), who opposed the bill from the start, commented that Thomas' remark seemed very much of an understatement. "This is the very thing I've been trying to tell them," Johnson said. "When they got the lead out of their pants on the recruiting machinery they got plenty of nurses. There wasn't really a shortage of nurses, but an overdose of red tape."

—*Chicago Sunday Tribune*, May 27, 1945.

Dermatologic Platitudes

ANOTHER cross borne by the dermatologist is the disposition of the public to link skin outbreaks to the blood or to organs not definitely implicated. What more meaningless sayings exist than "you have blood trouble" (acne, furunculosis); "too much acid in your system" (eczema, psoriasis); "liver is out of order" (keratoses, chloasma)? Granting that some of the diseases mentioned are not clearly understood and that many doctors feel they should give a definite cause when pressed for one, the attempt should be made to raise the patient's outlook above terms that mean nothing and lead to false conceptions. In treatment he has already leaped from sulphur and molasses to sulfa drugs and vitamins. Let us try to be more explicit in etiology. Psoriasis can be explained as probably caused by metabolic defects; boils as follicular infections; chloasma as often due to endocrine dysfunction. The medical columnists have already put advanced ideas into the heads of the public although even they also occasionally dip into old fashioned concepts. Our patient was happier with his platitudes, as was the savage in his natural environment, but we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cannot leave him there. We must carry him along with us to more rational viewpoints.

—E. F. C. in *Pennsylvania Med. J.*, quoted in *West Virginia Med. J.*, June, 1945.

DR. PILGRIM

SPEAKING at Columbus, before the Ohio Society of Safety Engineers, again on the "Labor Relations Value of Industrial Health Programs," where were about 40 minutes of presentation and an excellent response of two and a half hours of discussions and questions and answers. And later at dinner and pleasant converse on numerous matters with BOB FERGUSON, BILL FEHNEL, H. H. HENRY, ERNEST AUGUSTUS, and many others. . . . ON THE "400" to Eau Claire, Wisconsin, where a very pleasant evening with DR. PAUL BREHM and DICK PAGE, here being concerned with problems in industrial hygiene and industrial health, and especially the teaching of these subjects. And speaking successively at Eau Claire, Stevens Point, Appleton and Milwaukee on "Industrial Medicine: Scope, Present Status, Future Possibilities," in the series of Postgraduate Spring Clinics arranged by the Council on Scientific Work of the State Medical Society of Wisconsin, in cooperation with the Industrial Hygiene Unit of the State Board of Health and the various county medical societies, greatly enjoying the associations en route and during the meetings with the other speakers, DRS. FRITZ KANT, and HERMAN W. WIRKA, of Madison, JOHN A. TOOMEY, of Cleveland, and HAROLD COON, of Madison, the chairman, and where the dinner round-tables each evening were of unusual interest and the response and interest all that could be desired, and particularly enjoyable was the Milwaukee session, with DR. OSCAR SANDER of special help in answering and asking questions at the dinner round-table there. . . . AGAIN to Purdue to the Industrial Vision Institute with DRS. HEDWIG KUHN and GLENN GARDINER, who, with PILGRIM, spoke to the class on the many problems associated with industrial vision, industrial health and hygiene. . . . TO PEORIA on the "Rocket," meeting DR. GEORGE MONK, of the University of Chicago Physics Department, and discussing with him the technicalities of radiation. And next day at a compensation commission hearing, giving evidence—as to which was greatly puzzled by being asked by one attorney to assume a certain set of facts concerning the claimant, and then on cross examination being asked by another attorney to assume another set of facts. Wherefrom to meditate on the difficulties of translating legal procedure into terms of biological significance. . . . VISITING a small chemical plant with AL STEPAN and a whole afternoon of discussion of many diverse situations in the practice of industrial medicine and hygiene, with special emphasis on the need for broad application of educational measures in medical, engineering, and nursing schools. . . . SPEAKING before the Industrial Hygiene Session of the Greater Chicago Safety Conference on the subject "Industrial and Public Relations Value of Industrial Hygiene Service," with BEN KUECHLE, A. G. HEWITT, and BILL YANT on the same program, and WARREN COOK presiding, where were much conversation and the renewing of old acquaintances in the safety field and the consideration of many important problems. . . . THEN at two small plants, making periodic examinations with respect to various industrial hygiene exposures, on which previous surveys had been made. . . . AND at work on the itinerary of an extended eastern trip, which is to begin an important national survey with respect to the functions and relationships of industrial health departments. . . . READING Dana Burnet's lovely story of "The Question," in *Saturday Evening Post*—the question now being asked by many of the families of those who have gone on ahead to preserve our earthly peace. And now comes the Purple Heart posthumously to remind us of the valorous action of the son, also reminding us of the helpful words of Joseph Auslander:

"They are not dead, our sons who fell in glory,
Who gave their lives for Freedom and for Truth;
We shall grow old, but never their great story,
Never their gallant youth.
In a perpetual springtime set apart,
Their memory forever green shall grow,
In some bright secret meadow of the heart
Where never falls the snow."

AND now out in the sunshine with the old cronies of the softball league, where it was good to hear the welcoming words, to one who has been so long absent. And so to carry on. . . .

"In Rheumatic Fever—

Salicylates either in the form of aspirin or sodium salicylate, should be given as needed for pain and control of temperature."

—Sherwood, K.K. and Zimmerman, B.: Northwest Med.J., 42:288-292 (Oct.) 1943

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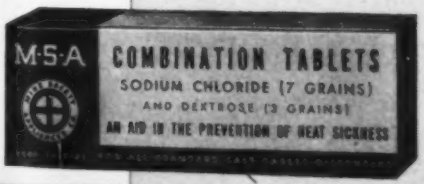

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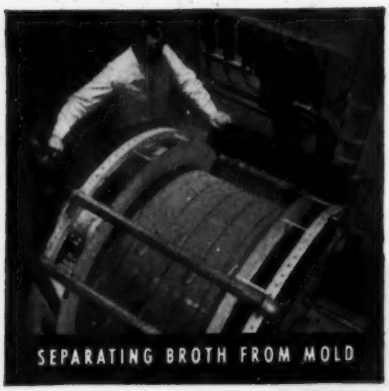
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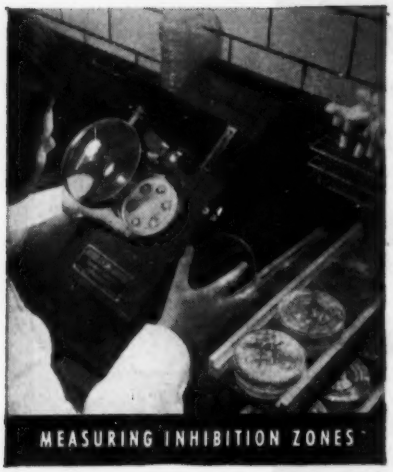
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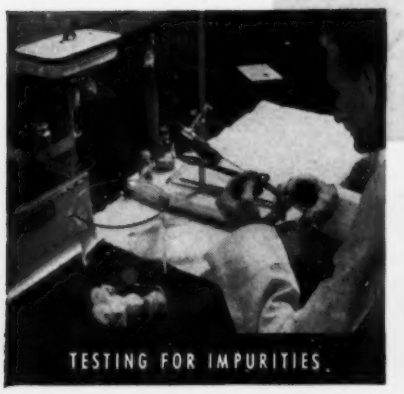
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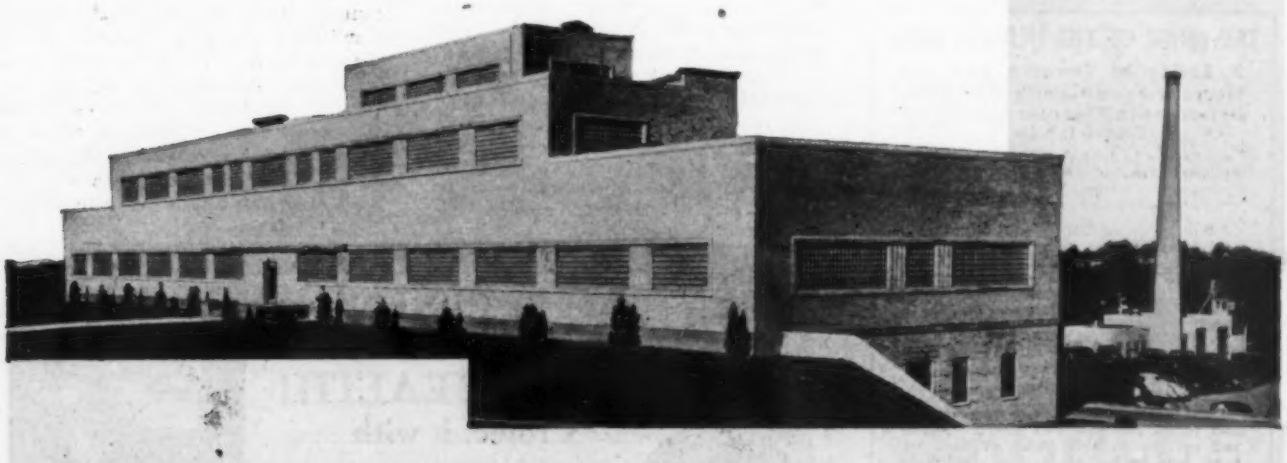

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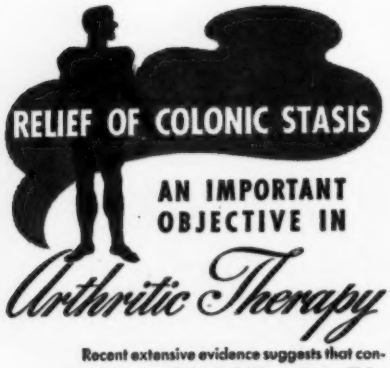

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1. **PROMPT** *relief of colonic stasis.*
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3. **STIMULATION** *of renal clearance of toxins.*
4. **RELEASE** *of colloidal sulfur, so frequently deficient in the arthritic economy.*

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The sulphur-bearing saline detoxicant-eliminant

FORMULA: Occy-Crystine is a hypertonic solution of pH 8.4 made up of the following active ingredients: Sodium thiosulfate and magnesium sulfate, to which the sulfates of potassium and calcium are added in small amounts, contributing to the maintenance of solubility.

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THE MIND OF THE INJURED MAN

A Study of Trauma and the Nervous System, with Particular Reference to Neuroses Associated with Injury

by Joseph L. Fetterman, M.A., M.D., Assistant Clinical Professor of Nervous Diseases, Western Reserve University School of Medicine, Cleveland, Ohio

"The reading of this manuscript has been an interesting and informing experience, which I hope will be shared by many. This is not just a book, it's a very good book!" —Foster Kennedy. Cloth, 6x9, 270 pages, 28 illustrations, bibliography, index. Price $4.00.

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238 pages; 30 illustrations

Sixty per cent of the adult population is said to be afflicted with pruritus perinei and yet the bedside physician does not know how to handle it. This important book is the first comprehensive monograph on this complex and distressing affliction. Published in 1938 at $5.00—Now..$3.00

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COMMENT and OPINION

The Vitamin Business

IT BOILS down to this. Nutritionists acknowledge that a large segment of the United States population needs more food and better food habits. To raise inferior dietary standards, they urge a nation-wide program of education in the careful selection and proper cooking of food—not pills to compensate for the lack of both. Until good food—and good cooking—can be made as glamorous to the public as pills, quantities of pills of some sort will undoubtedly be sold. Already the pharmaceutical world is buzzing with plans for commercial production and over-the-counter sale of amino acids. These protein elements, found in meat, eggs, fish, etc., may be produced synthetically, packed as compactly as possible, and sold with slogans featuring "quick-energy" appeal. Perhaps the challenge to the United States food industry, implicit in this fact, will one day be met. It is also a challenge to the United States consumer to get wise to good food and good cooking.

—*Fortune*, May, 1945.

Allergy Here to Stay

WHAT is allergy? The word comes from the Greek meaning altered reactivity. It was first applied by von Pirquet in 1906 and indicates a reversible reaction in the tissues, the pathological changes of which are transient, seldom seen postmortem, and not limited to any one organ. Allergy is a symptom-complex which may be inherited or acquired actively. Active sensitization can be produced through the intact intestinal tract, the skin, or the respiratory tract, though most often there is a history of previous exposure. For one to understand allergy it is necessary to know general medicine, immunology, psychiatry, bacteriology, mycology, physiology, pathology, and botany. This is a great deal to expect of one person, so it is necessary to incorporate the knowledge gleaned from each branch into one, and to obtain cooperation between all to do our best work.

—KATHERINE B. MACINNIS, M.D., in *Southern Med.*, reprinted in *West Virginia Med. J.*, May, 1945.

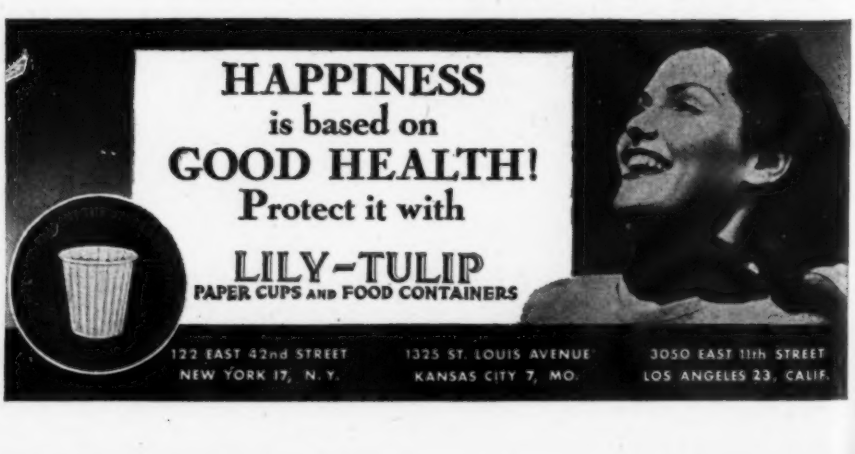
Impaired Workers

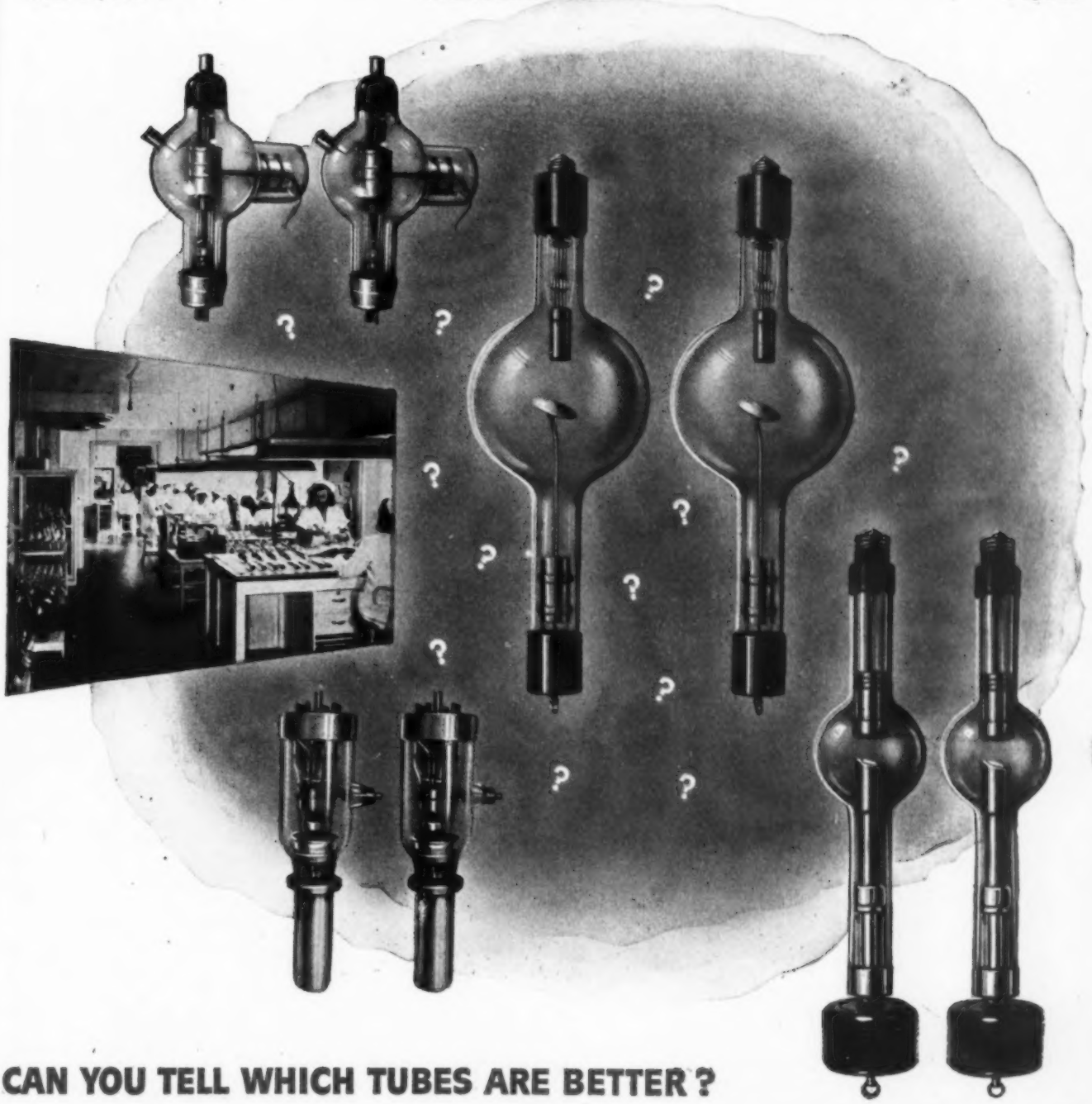
THE Bureau of Labor Statistics conducted a survey of the utilization of physically impaired workers in 300 manufacturing industries. These workers were found to be just as efficient in the jobs they held as their unimpaired fellow workers and they were rated as superior in respect to absenteeism, injury frequency and labor turnover. Although this survey covers only a comparatively small number of plants it is the first study of this magnitude. The replies which were received in the mail survey were evidently not based on actual statistical measurements, although such measurements would probably confirm their validity. The Bureau hopes to be able to continue its survey, to provide objective, factual data. The factor of careful placement and supervision is stressed. The study is especially timely in view of the problem of placing returning veterans, which industry is facing.

—*Industrial Hygiene Digest's* abstract (April, 1945) of "Impaired Workers in Industry," by C. A. TRUMP and F. J. MONTGOMERY, in *Monthly Labor Review.*

"Combat Fatigue" Misunderstood

COLONEL JOHN M. HARGREAVES, ATSC Chief Surgeon, Wright Field, Ohio, says that combat veterans who were neuropsychiatric casualties of war have been rehabilitated and reassigned to important duties in the Air Technical Service Command, as in other commands of the Army Air Forces. "It is time the public is made to understand the true significance of casualties labeled 'neuropsychiatric' and the fact that there is no reason why these soldiers cannot and will not, after proper treatment and cure, resume their places as confident, productive members of the AAF or of their civilian communities. Such understanding would be a very real aid to these men in recovering completely from their illness—for persons requiring neuropsychiatric care are sick in the same sense in which a person may become ill as the result of any other type of disease or injury and, like any other, this illness





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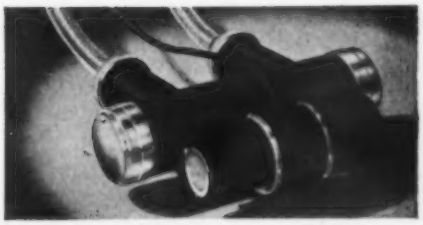

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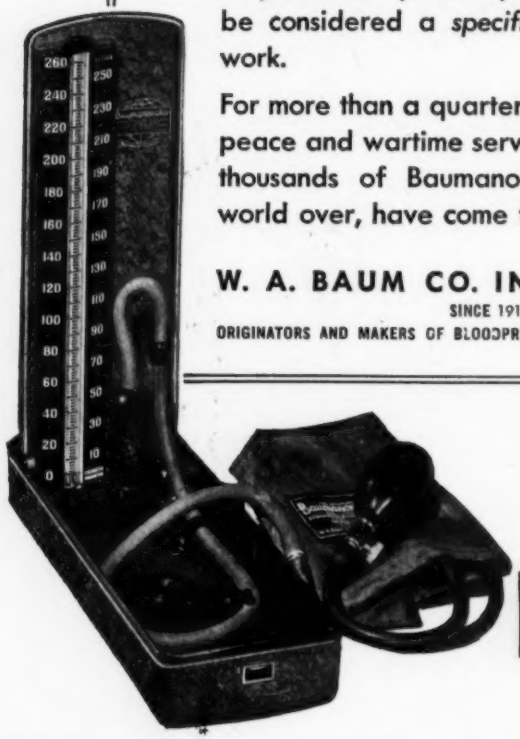

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may have delayed effects." A neuropsychiatric condition by no means implies lack of courage or stamina under fire on the part of the individual concerned. On the contrary, it is more likely to appear after his successful completion of an operational tour of duty and his return to this country. The fatigue, tension and anxiety he has undergone through a long period of abnormal stress then may result in his finding it difficult to readjust himself to changed conditions. The soldier has undergone frequent response to danger and insecurity, and no matter how well he has controlled that fear and directed it into courageous action, physical and psychological symptoms of the resulting illness may occur afterward. "Far from adopting a morbid attitude toward the veteran who has needed neuropsychiatric treatment, we should credit him with the basic strength he has displayed under the terrible demands imposed upon him by war, and remember that he emerges from combat with assets as well as liabilities. The AAF has established a splendid leadership in the rehabilitation of these soldiers, and many of them are filling more responsible positions and performing more valuable services now than they did before."

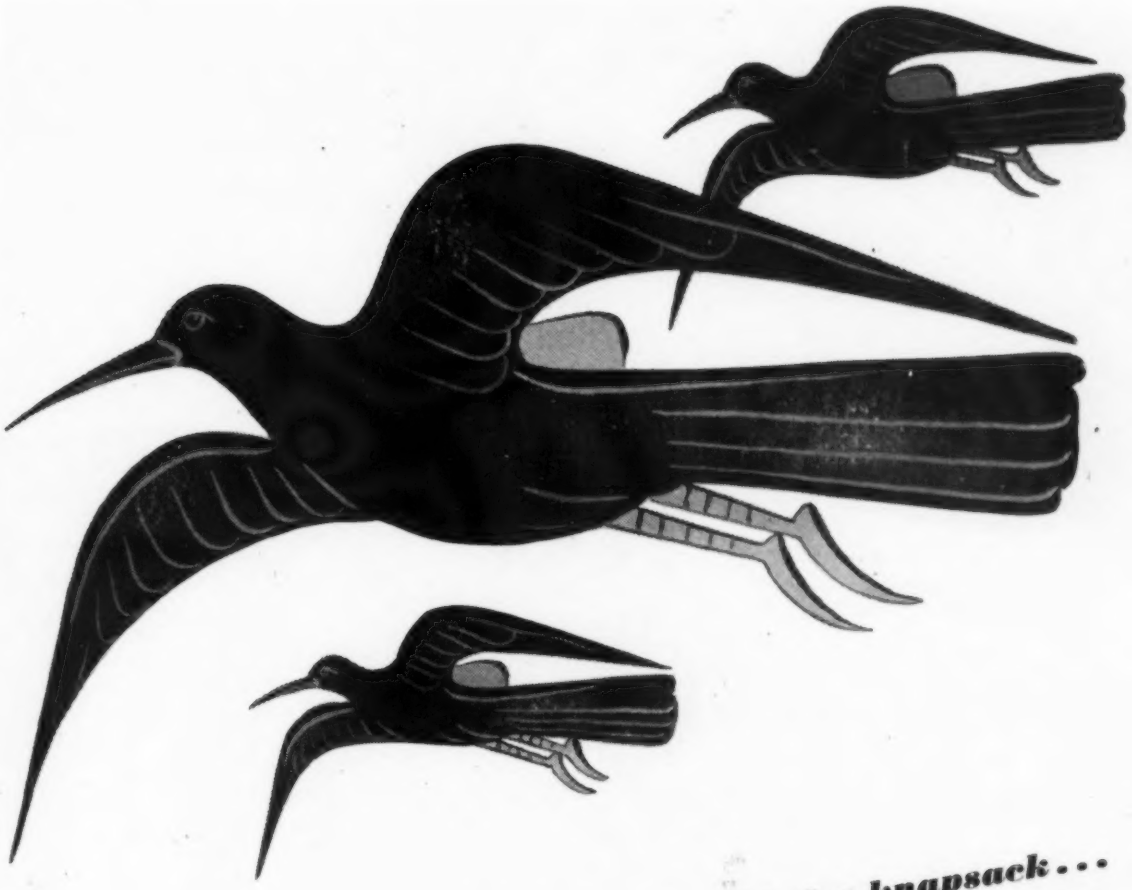
Vitamin Reports

DR. TOM D. SPIES, director of the Nutrition Clinic, Hillman Hospital, Birmingham, Alabama, reporting to the clinic's sponsor, the University of Cincinnati, stated that in 1944 there had not been one death among 5,845 men, women and children treated in the clinic for deficiency diseases. More than 800 cured patients, he said, have gone back to work, many in heavy industries, and 41 to the armed forces. Synthetic vitamins—thiamin, riboflavin, ascorbic acid and niacin—are prescribed at the clinic as supplements to normal eating habits. . . . DR. ROBERT S. HARRIS, Associate Professor of Biochemistry of Nutrition, Massachusetts Institute of Technology, now reveals that upward of 35% of accepted nutritional values are lost through "bulk cooking" for military consumption in barracks or aboard ships, or for civilians in hotels and restaurants. "When you pick food for analysis off the fork, as it were, you find that between 30 and 50% of the nutrients you might expect to find in it have been lost before they have reached the consumer's plate." Gaining wide notice is DR. HARRIS' so-called "Snatch Test." With associates of the Nutritional Biochemistry Laboratories of M.I.T., he subjected to chemical analysis three meals of each of 71 subjects. The meals were literally "snatched" from their plates to determine the thiamin, riboflavin, niacin, ascorbic acid, calcium and iron content. Adequacy of the diets was measured by comparison with the recommended dietary allowance of the Food and Nutrition Board, National Research Council. So measured, the average daily intake was found to be adequate in ascorbic acid, calcium and iron, but inadequate in thiamin, riboflavin and niacin. Only 7% of the subjects obtained an adequate intake of all these nutrients. Only 35% received the minimum daily requirement of the Food and Drug Administration in thiamin, riboflavin, ascorbic acid, calcium, and iron.

—Office of Pharmacal Information.

Vitamin Pills for Workers

THE TWO opposing schools of thought on the advisability of supplementing workers' diets with vitamin pills have been aptly summarized by Cowgill (*Am. J. Pub. Health*, 34: 630 (1944)). On the one hand, it is argued that surveys have shown that a large part of the American people, many of whom are workers in industry, do not get sufficient vitamins to support optimal health and that this subnormal health is manifested as poor industrial performance, early fatigue, poor recovery from fatigue, and increased absenteeism. Since vitamins are relatively inexpensive and harmless in the usual dosage, such supplementation would constitute a valuable contribution which management can make to the health of the workers. Opposed are the facts that vitamins constitute only a few of the many dietary factors needed for health, and that a diet of properly chosen natural foods is the goal to reach to supply all the needed factors. Therefore, if any dietary essentials are needed by the workers, they should be furnished as natural foods of high nutritive value, and it is the responsibility of management to furnish adequate facilities



even the crow carried a knapsack . . .

There is an old proverb that describes a certain stretch of land so barren that even a crow flying across it must carry his lunch in a knapsack or perish of starvation.

Yet with all respect to the old proverb, even the most barren wasteland—utterly fallow and devoid of fertility—is rich in an important therapeutic crop, Dubos' soil bacillus (Bacillus brevis) from which is derived a powerful antibiotic agent, TYROTHRICIN CONCENTRATE, Sharp & Dohme. This potent bactericide actively combats a host of deadly infections and—even when applied in high dilution—attacks such gram-positive organisms as pneumococci, streptococci, diphtheria bacilli, staphylococci, certain anaerobic bacilli and others.

TYROTHRICIN is remarkably effective in the treatment of superficial indolent ulcers, abscesses of the skin and soft tissues, mastoiditis, empyema, certain types of wound infections and chronic purulent otitis media.

TYROTHRICIN is used in various strengths but is commonly employed as an isotonic solution containing 0.5 mg. per cc. by instillation, irrigation or wet dressing. It is highly efficient as a topical application or it may be instilled into various body cavities not connected with the blood stream, such as the paranasal sinuses, urinary bladder and pleural cavity. It is not indicated for parenteral injection or for oral use.

TYROTHRICIN CONCENTRATE (For Human Use) is supplied in the following packages: M 330-419—Package containing 1 cc. ampul of a concentrated solution of TYROTHRICIN, 25 mg. per cc., and a vial containing 49 cc. of pyrogen-free, sterile, distilled water for diluting the concentrate before use. M 330-022—20 cc. vial of a concentrated solution of TYROTHRICIN, 25 mg. per cc.
Sharp & Dohme, Philadelphia 1, Pa.

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CONCENTRATE

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*Soapotage is West's name for the use of hand cleansers that contain harsh chemicals or harsh abrasives which tend to harm the skin and make it more susceptible to occupational skin diseases.

Many of the nation's greatest plants encourage proper cleansing by supplying their workers with Lan-O-Kleen and Sulpho. Thus workers who handle materials which are difficult to remove at wash-up time, will not resort to using some hand cleaner that may contain harsh chemicals or an abrasive cleaner containing grit and sand in order to remove tenacious soil.

LAN-O-KLEEN †

is the first industrial hand soap to provide a full measure of the double action of effective cleansing and proper superfatting with soothing, protecting lanolin. It is a powdered soap of mildly alkaline reaction compounded with granular corn-meal which has been impregnated, by an exclusive process, with anhydrous lanolin. In its use, the lanolin in Lan-O-Kleen buffers the mild alkaline reaction of the soap (necessary for proper cleaning), protecting the natural oil film of the skin and leaving the hands ready for top-speed production.

SULPHO HAND CLEANER

is made from sulfonated castor and vegetable oils. It does not contain any mineral oil. Especially suited to workers who encounter chemicals tending to remove normal fat of healthy skin, for naturally dry skin and for those who are required to dip their hands in solvents and degreasing compounds. West recommends that both Sulpho and Lan-O-Kleen be made available to give *all* your workers adequate protection.

† Reg. U. S. Pat. Off.

The photograph illustrates a typical installation in a large aircraft plant showing one method of attaching Lan-O-Kleen dispensers to liquid soap tanks. Thus workers, in addition to having Lan-O-Kleen conveniently at hand to do the "heavy duty" cleaning may also have Sulpho available.

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CLIP TO YOUR BUSINESS LETTERHEAD, PLEASE

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Please send me a SAMPLE QUANTITY of Lan-O-Kleen ☐ Sulpho ☐ with which I will give your claim a practical test. Please include folder explaining its use.

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Combine these two

YALE B-D LOK-NEEDLE WITH *NEW HUBER POINT*

- Yale B-D Lok-Needles are supplied with regular point or with Huber point — at the same price.
- The Huber Point has a lateral bore-opening as contrasted to the frontal bore-opening of regular point needles.
- The lateral bore-opening materially reduces the cutting of tissue plugs.
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- Yale B-D Lok-Needles, regular or Huber Point, lock on Yale B-D Lok-Syringes.
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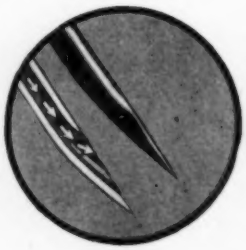

YALE B-D LOK-SYRINGE WITH *METAL LOCKING TIP*

- Yale B-D Lok-Syringes last longer and do a better job than all-glass syringes.
- Yale B-D Lok-Syringes have a strong glass tip capped with permanently attached metal needle-locking device.
- The original cost of a Yale B-D Lok-Syringe is the same as a good quality all-glass syringe.
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- Specify Yale B-D Lok-Syringes.

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to make this possible. Fishbein, Tannenbaum, and Shannon (INDUSTRIAL MEDICINE, 13: 6, 489, June, 1944) report the results of a study based on the former point of view. They cite the Stiebeling and Phipard survey of 1939 (*U.S.D.A. Circular No.* 507 (1939)) and the report of the Committee on Diagnosis and Pathology of Nutritional Deficiencies of the Food and Nutrition Board (*Bull. National Research Council No.* 109 (1943)) as justification for the assumption that a portion of their subjects were inadequately fed. Since inadequacy of the B-complex vitamins is especially likely to occur, they evaluated the change in certain common complaints after daily supplementation with a preparation containing 1 mg. of thiamin, 1 mg. of riboflavin, 5 mg. of niacin, and small amounts of pyridoxine and pantothenic acid. Although details are lacking regarding dosage and precautions to make sure that the preparations were actually consumed, it can be inferred that this supplement was taken daily for about three months by 311 subjects, and that 57 additional subjects received a placebo for the same length of time. All subjects were employed in industry, about half doing heavy work and half doing office and clerical work. At the end of this period the subjects were asked to note any change in physiologic characteristics — constipation, mental alertness, tiredness, eyestrain, number of colds, other general illnesses, skin eruptions, appetite and sleep—and the effect classified as favorable, unfavorable, or unchanged. The group receiving the placebo and the group receiving medication show a larger favorable than unfavorable change in all categories. This is attributed to the psychologic effect, and the authors propose that the effect of supplementation can be measured by the difference in the percentage of favorable responses in the subjects receiving vitamins and in those receiving placebos. In the case of constipation, 20% in the medication group had a favorable response compared to 12% in the placebo group, hence the residual 8% is adduced as a true medication effect. Medication had a residual favorable effect on 16% with respect to tiredness and on 10% with respect to appetite and to sleep. Favorable effects were almost equal in medication and control groups with respect to the other characteristics noted. After these results were tabulated the groups were reversed; those who had previously received placebos received medication and vice versa. The duration of the second portion of the experiment is not stated; 47 subjects receiving medication and 181 receiving placebos completed the experiment. In this second period, favorable effects on constipation, eyestrain, number of colds, other general illnesses, and skin eruptions in the supplemented group exceeded such benefits in the control group. However, mental alertness, tiredness, appetite, and sleep were improved more often in those receiving the placebo. The data are also analyzed by following each group through both periods, a procedure which in a sense permits each subject to be his own control. When the group which received medication first is considered, the incidence of a favorable response in the supplementation period is higher than in the placebo period with respect to each of the characteristics noted. Application of the Chi square test indicated that it was extremely unlikely that these differences could arise by chance. Apparently on this basis the authors conclude that "supplementation of the average diet with vitamin B-complex had a favorable effect in the reduction of constipation and fatigue . . . a beneficial effect on mental alertness, appetite and sleep. It may also have some value in relation to eyestrain." However, this conclusion ignores some of the published results of the study. When the group which received placebos first is considered throughout both periods, the incidence of favorable change during the placebo period exceeded such improvement during the supplementation period by 10% with respect to mental alertness, 7% with respect to tiredness, 13% with respect to appetite and sleep. Residual differences in favor of the medication period were 5% or less with respect to the other characteristics. A conclusion in accord with all the recorded findings and with the statistical considerations involved would be that the incidence of favorable subjective response was greater to whichever pill was given first, whether it be a placebo or the supplement. It would appear that the factor of suggestion is so great that any attempt to use subjective responses to therapy in evaluating the

X-ray Dermatitis, Burns, Trophic Ulcers, Miscellaneous Wounds Respond to

White's Vitamin A and D Ointment

By stimulating granulation and promoting epithelization, the vitamins A and D of fish liver oils as provided in White's Vitamin A and D Ointment have shown their efficacy in a variety of skin lesions.

The therapeutic value of the cod liver oil vitamins is now well known in the topical treatment of wounds and burns, x-ray sequelae, trophic ulcers, crushing and avulsive soft-tissue injuries familiar in industry.

White's Vitamin A and D Ointment provides the A and D vitamins from fish liver oils, in the same ratio as found in cod liver oil, and in a suitable lanolin-petrolatum base. The ointment is free from excessive oiliness, has a pleasant odor and will keep indefinitely at ordinary temperature.

In four convenient sizes: 1.5 oz. tubes, 8 oz. and 16 oz. jars, 5 lb. containers. Ethically promoted—not advertised to the laity. White Laboratories, Inc., Pharmaceutical Manufacturers, Newark 7, N. J.

White's PRESCRIPTION *vitamins*

As is commonly observed by physicians, persons with one deficiency syndrome will likely have associated deficiency diseases, these deficiencies often being related to the vitamin B complex group. And, too,
the clinical picture of hypovitaminosis is generally marked by an inadequate diet, because of reasons often uncontrollable, such as vitamin losses from excessive cooking, improper storage, transportation, point rationing, and from high costs of food. However,
fatigued, listless patients with ill-defined symptoms involving nerves and general metabolism have been less of a problem since forceful vitamin B complex is readily available. Therefore, we suggest the physician's versatile co-worker—vitamin B complex-Breon, in three convenient forms—
BREONEX-STRONGER
In vials for various doses intramuscularly. For use when rapid and certain absorption is required.
BECAPLETS
compressed in the shape of capsules and sugar coated; from yeast powder fortified with thiamine, riboflavin, pyridoxine and nicotinamide.
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A liquid, potent and as palatable as a chocolate sundae. For easy administration, especially in children.
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effect of supplement is hazardous, even though a control group is used.
—From *Nutrition Reviews*, 2:11, 342-344, November, 1944.

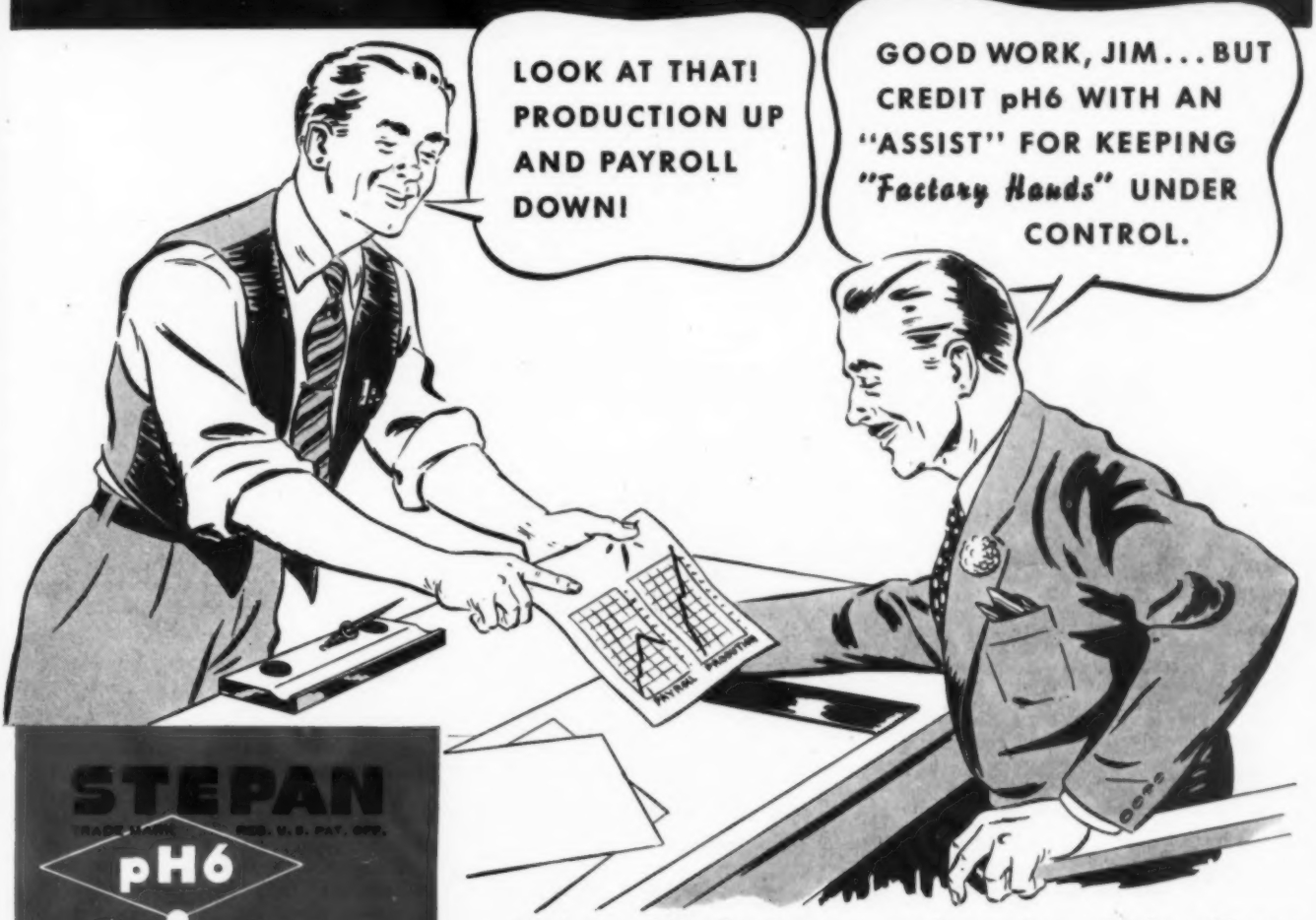
Organic Solvent Vapors

ALL VOLATILE organic solvents, including gasoline, benzene (benzol), naphtha, carbon tetrachloride, and trichlorethylene, give off toxic vapors. Hence, workers using any of these solvents in cleaning, degreasing, cementing and other operations must be protected from the effects of inhaling excessive amounts of these fumes. Basic protection is provided by keeping the concentration of solvent vapors in the general atmosphere of the workroom below "the maximum allowable concentration (m.a.c.) for continuous exposure." This limit, which represents the maximum concentration of solvent vapor to which workers may be continuously exposed during the eight-hour work day, has been established by the American Standards Association for several of the commonly used solvents, but many states have standards of their own. The limits vary from 50 parts of solvent vapor per million parts of air for benzene to 1,000 parts per million for petroleum products unmixed with more toxic substances. Solvent users can obtain M.A.C. tables from the Industrial Hygiene departments of their respective states, or, in states without such departments, from the U. S. Public Health Service, Washington, D. C. Natural ventilation may suffice to provide this basic protection where the contamination of the atmosphere is slight, as where the solvent is being used in small quantities or is applied in equipment that prevents the escape of vapor. In other cases, it may be necessary to employ some form of mechanical ventilation, such as a local system which will draw off the vapors as they arise or strong general ventilation which will rapidly dilute the vapors to a safe level, as advised by a ventilating engineer. Working conditions in a plant are probably satisfactory if the air is free from the pronounced odor of the solvent being used; but, since odor is not an adequate criterion, an atmosphere survey should be made. This requires the services of a competent chemist. In some states, such work is done by the State Industrial Hygiene Department on request. However, even where the workers as a group are effectively protected by these measures, certain individuals may be endangered by practices like the following: Using solvents in poorly ventilated areas, such as small rooms, basements, pits, etc.; applying solvents in close proximity to the face, as in spotting garments or cleaning floors or machinery; working over open containers of solvents; handling products damp with solvents; opening containers or equipment holding solvents in such a manner that high concentrations of the vapor are inhaled; permitting drafts to blow solvent vapors in the direction of workers; allowing persons to work with solvents to which they are abnormally sensitive; entering tanks containing solvent vapors without proper respiratory protection. It is not enough to prohibit such practices. Workers must also be educated to the dangers involved, and constant supervision must be maintained to prevent any one from taking chances. When workers are unavoidably subjected to excessive concentrations of solvent vapors, they should be protected with suitable gas masks. Where the vapor concentrations are relatively low, canister-type masks approved for organic vapors by the U. S. Bureau of Mines may afford adequate protection; but, for high concentration, as in vapor-filled tanks, approved air-line respirators must be employed.
—*Rayon Textile Monthly*, April, 1945.

Appendicitis

DESPITE the known dangers of appendicitis unqualified persons continue to attempt its treatment and to cause many needless fatalities. It is therefore essential that some of the characteristics of the disease and the dangers which accompany it should be generally recognized. Usually, appendicitis occurs among younger people—that is, from the age of 10 to 35—although it is also found in infants and among the very old. The disease is an inflammation of the appendix, which is a blind tube opening into the colon or large intestine. The cause of the inflammation is infection which is often rendered worse by some mechanical blockage which makes it difficult for the appendix to empty itself and which lessens its blood supply and injures its walls. Infection reaches the appendix either through its con-

pH6 SAVES HIDDEN COSTS BY ENDING *"Factory Hands"*


LOOK AT THAT! PRODUCTION UP AND PAYROLL DOWN!
GOOD WORK, JIM... BUT CREDIT pH6 WITH AN "ASSIST" FOR KEEPING *"Factory Hands"* UNDER CONTROL.
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pH6

Skin cleanser

SULPHONATED OIL ...NON-LATHERING

Production falls off and costs go up when workers suffer from "Factory Hands" . . . the raw, red, defatted skin condition that causes workers so much discomfort, embarrassment and even loss of manual dexterity. "Hidden costs" pile up . . . from lower employee morale and productivity, from time lost at the dispensary, and often from the forced transfer of trained workers to less skilled jobs at the same high hourly pay.

pH6 in wash-rooms cuts "Hidden Costs"

To which department are these "hidden costs" charged? They should properly be charged to sanitation . . . because "Factory Hands" *is usually due to incomplete or harsh wash-up methods* . . . rather than the substances handled by employees in the course of their work. Many plant records show that "Factory Hands" disappeared when workers began washing with Stepan-pH6 Skin Cleanser.

Economical for plant-wide use

pH6 gently yet speedily removes nearly all types of industrial grime . . . even those which stubbornly resist harsh alkaline soaps. It is a sulphonated oil of *dermatological quality*. Yet in cost it is comparable to good grades of industrial powdered hand soap . . . and it *saves* money by eliminating "hidden costs." Convenient dispensing methods are available. Write today for samples and technical data.

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"Total" Therapy
FOR INDUSTRIAL DERMATITIS

"The therapy of a majority of the cases of contact dermatitis encountered in industry", according to the noted dermatologist, Dr. Frank C. Combes[1], "requires no further medication than the intelligent use of a *good buffer solution such as Liquor Aluminum Acetate (Burow's solution)* . . . and a *good crude coal-tar paste.*"

His preference for wet dressings solution is **Domeboro Tabs** ("widely used in industry", particularly by Parkes[2] at Curtiss Wright for cutting-oil dermatitis)—because it is "a convenient tablet which, when dissolved in water, releases a *lead-free aluminum acetate in appropriate dilution,*" with a substantial percentage of boric acid.

The *crude coal-tar paste* used at New York University, according to Combes, "is manufactured commercially under the name **Daxalan**"—which has been found *superior to distillates, filtrates and pastes containing liquor picis carbonis.*

It must be properly applied for "optimum benefit", and Combes advises thinning with **Domolene** for spreading over a large area —because in his judgment its hydrophilic ointment base "does not materially lessen the therapeutic efficacy of the paste."

With tissue repair under way, and only erythema remaining, the use of **Domeboro Ointment** (each ounce of which, in a special hydrophilic base, possesses the therapeutic action of one Domeboro Tab diluted in a pint of water), permits a quicker return to work, while healing is promoted by its efficient topical action.

(1) Combes, F. C.: Indus. Med., July, 1944.
(2) Parkes, Morey: Indus. Med., January, 1944.

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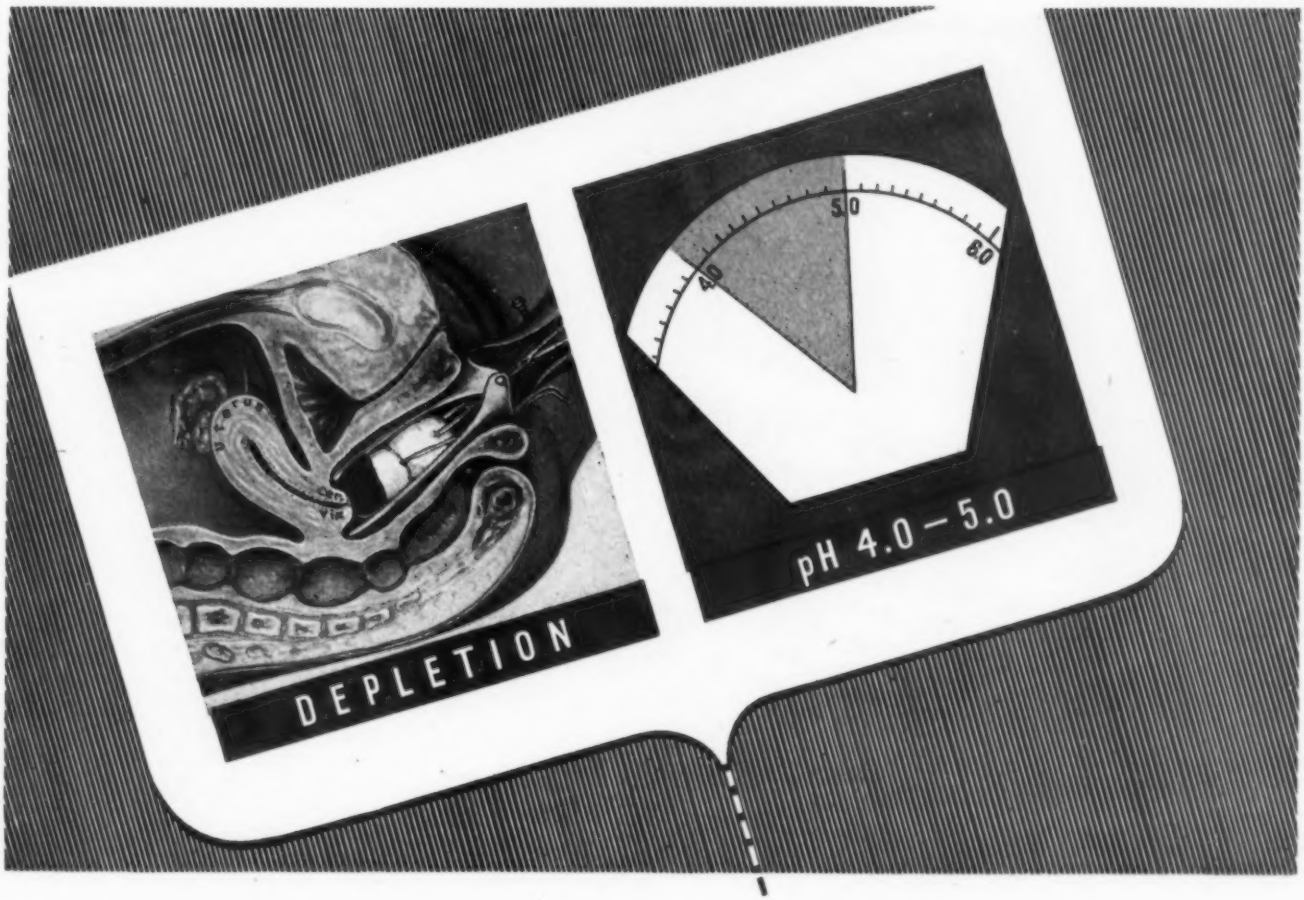
tents or through the blood stream. It is possible, for example, for an infection of the throat to be conveyed to the appendix by the circulation and result in appendicitis. The diagnosis of appendicitis is at times extremely difficult. Almost any abdominal pain may be due to it. For this reason, the diagnosis and treatment of abdominal discomfort by those untrained in these matters is fraught with great danger. How complex the problem of diagnosis may be becomes apparent when one considers the many possible symptoms. In the first place, the intensity of pain varies greatly from a mild discomfort to a severe, intolerable pain. This pain may be felt in the lower right side of the abdomen or it may be generalized. Nausea and vomiting are frequently but not always present. At times there is diarrhea although constipation is common. There may be an elevation of temperature. It is clear that a patient with abdominal pain should be promptly examined by a physician who may wish to add to the findings of his examination the results of a blood count and possibly other tests before reaching a diagnosis. Once the presence of appendicitis is determined—or even definitely suspected—surgical treatment is carried out. There is no medical treatment for appendicitis. It is of the utmost importance to remember that whenever there is any possibility of appendicitis no laxatives should be given since perforation of the diseased appendix may follow. Nor should any medicine be given to reduce pain since this might confuse the diagnosis. In fact, the patient should receive nothing by mouth. An ice bag may be placed on the right lower abdomen. However, the most vital measure is to summon a physician at once and to follow his judgment in obtaining laboratory aid and surgical consultation. If the doctor suggests operation it should be remembered that surgery carries little risk while neglect may be fatal.

—*Westinghouse Medical Department;* published by Westinghouse for its employees.

Permanente Family Health Plan

THE *San Francisco News* for March 19 carried an interesting story concerning the Permanente Foundation Hospital in Oakland. Excerpts follow: Details of a new family health plan, in effect at the Kaiser shipyards, providing for medical and hospital care for worker, wife and minor children, have been anounced by DR. SIDNEY GARFIELD, director of the Permanente Hospital Foundation. The family plan supplements the emloyee health plan—which covers individual employees only—but does not displace it. Before the family plan was effected, an employee paid 50 cents weekly for his personal coverage. Now, for an additional 75 cents weekly, his wife is provided for, and the cost to the employee for child coverage is 50 cents for one child and $1.00 for two or more children. Thus the maximum cost, irrespective of the number of minor children, is $2.25 a week per family. The family plan is open only to shipyard employees who hold the gold anchor pin—those with 18 months of employment with a clear record—and executives and others who are exempt from punching timeclocks. "Our only regret is that we cannot make it available to all our employees at this time," said C. D. Bedford, vice-president and general manager in Richmond. "We hope to arrange medical and hospital facilities to accommodate the families of every shipyard employee in the near future." For the time being, employees and their families are being enrolled without physical examination. After 30 days, examinations will be required. If one member of a family is rejected after examination, all other members remain eligible. Individual employees not eligible for the family benefits will continue to be covered for 50 cents weekly, and an employee in this category may obtain obstetrical services for his wife for a $200 fee—including pre-and post-natal care, medicines, use of delivery room, doctors, nurses, hospitalization, maternity ward, and care of the infant during confinement. Subscribers to the family plan receive this service for an additional charge of $60. During the period of the "national emergency," a charge of $2.00 will be made to families for home calls by doctors, but home calls by Permanente visiting nurses will be free. Ambulance service is provided within a radius of 30 miles from the Richmond or Oakland hospitals. Disease and illnesses excluded under the plan include those for



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1. Kleine, H. L., J. Mo. State M. A. April, 1939

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—*San Francisco News*, March 19, 1945, quoted in *California & Western Med.*, 62: 4, 200, April, 1945.

Looking Backward

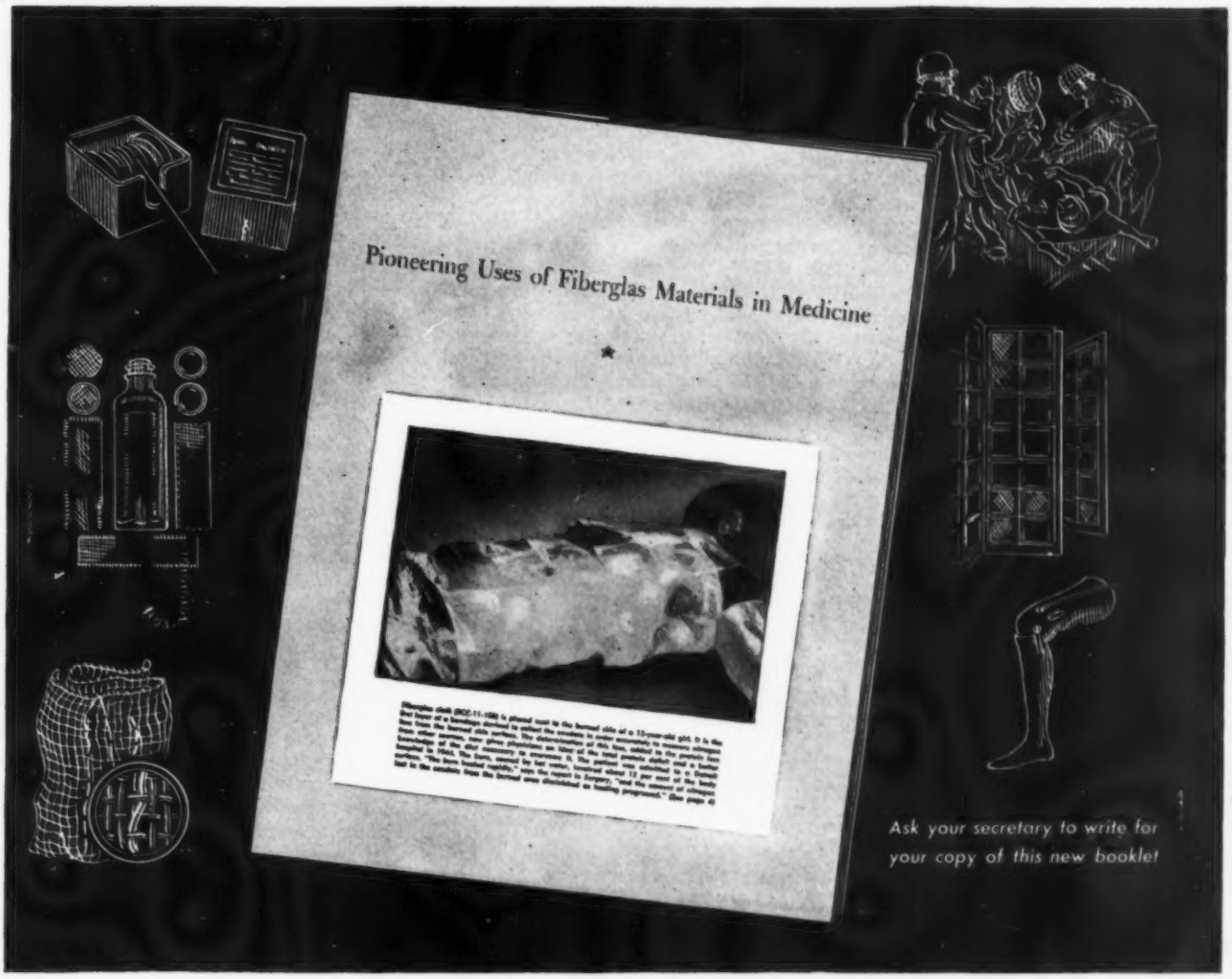
THE growing need for "business statesmanship" is creating a new appreciation of history as an aid to management. Although business has received far less attention from the historian than other subjects, some material is available and more may be expected. The recently formed Society of American Historians plans to devote itself to industry among other subjects, and is cooperating with the Newcomen Society, which has long been devoted to technological history. Schools of business administration have for some time conducted research in business history and have compiled the histories of several industrial and commercial regions and of individual companies. Through many company histories the same pattern of managerial development unfolds; a company is founded by a creative and dominant individual and, after preliminary struggles, attains a moderate success. Then, as the founder's conservatism grows, the company experiences difficulty with competition and ends either in dissolution or the acceptance of new management. In companies successful enough to become subjects for historical studies, the new management uses the resources gathered by the founder with sufficient vision to raise the company to national importance. Usually by the second generation the management group has become broad enough to insure continuity. This is not always true, however; and it is chastening to the modern executive of a large corporation to learn that in 1902 the management of du Pont, then 100 years old and leader of the American explosives industry, decided to sell the business to its largest competitor because the coming du Pont generation did not seem promising. Only the last-minute plea of a trio of young du Ponts outside the management prevented the sale; it was this new group, not previously considered adequately experienced by its elders, which led the company into industrial chemistry. History often provides cheaply experience which originally cost dearly. Thus the Union Pacific Coal Mines in Wyoming sought to alleviate a troublesome labor situation by importing Chinese miners. Tensions between whites and Chinese finally culminated in 1885 in a massacre with 26 deaths and bitterness that lasted for years. Even the effect of changes in working rules and conditions can be traced in several company histories. In announcing an increase in working hours in 1899, N. W. Ayer & Son was forced to add "let us also be careful that no one is hurt in the halls and stairways in rushes such as have recently followed the closing gong." By 1912, however, the management had come to believe that "a reasonable shortening of our business hours would result in the speeding up of our business machines," a conviction confirmed by later developments. Several professional historians have urged business executives to sponsor the preservation of selected records which will enable future historians to obtain a picture of the forces governing a company's development. It has even been suggested that large companies establish a business historian as staff assistant to the president. Such a man, trained in the social sciences rather than in the particular techniques of the business, would be responsible for judging current and future developments in the light of historical perspective. As a relatively disinterested observer of a company's activities, he could be responsible for a really candid appraisal of company policy as it developed.

—From the *Industrial Bulletin* of Arthur D. Little, Inc., No. 210, May, 1945.

DDT Toxicology

ONE of the first points considered in connection with the development of a new insecticide is its toxicity to man and higher animals as well as to various lower forms of life beneficial to man. Therefore as soon as the marked insecticidal value of DDT was determined by the Orlando laboratory steps were taken to have the toxicologic effect of the material investigated by DR. HERBERT O. CALVERY and his associates in the Food and Drug Administration and

—*Continued on page 528.*



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CURRENT ARTICLES of QUALITY

Meat as a Foreign Body

IRVING H. WIESENFELD, M.D., M.S., Department of Otorhinolaryngology, Permanente Foundation Hospitals, Oakland and Richmond, California, "Meat as a Foreign Body in the Adult Esophagus—Report of Three Cases." Text: "Review of the literature would appear to reveal that the occurrence of meat as an esophageal foreign body is not a rarity. In Hollinger's series, reporting 525 foreign bodies in the air and food passages, meat constituted 7.6% of all the foreign bodies. Certain interesting aspects of these cases, however, warrant their reporting. *Case 1:* Patient C. S., a 53-year-old white male shipyard worker had been absolutely well with no previous history of esophageal disease prior to May 3, 1944. About 8:00 o'clock that evening, while engaged in eating a steak in a city adjacent to Richmond, he suddenly discovered that his train to Richmond would leave in four minutes. Not wishing to leave any of the food behind nor to be late for work, he gorged the remainder hurriedly and ran to the train terminal. While on the train he began to have a vague feeling of retrosternal discomfort with sensations of nausea. At work that night his pain became progressively worse. Attempts to vomit produced nothing. Any attempts to swallow even water gave rise to pain and prompt regurgitation. At the hospital, a barium esophagram by fluoroscopy and roentgenography revealed complete obstruction of the esophagus at the level of the seventh thoracic vertebra, apparently as a result of impaction of a non-radiopaque foreign body. Under local anesthesia, a Jackson adult esophagoscope was passed perorally, and the obstructing steak removed completely with a grasping forceps. The patient's postoperative course was uneventful. No fever supervened. He was discharged from the hospital two days later after a check barium study of the esophagus revealed no further evidence of obstruction or foreign body. *Case 2:* Patient E. J., a 23-year-old white female welder, gave the history that at the age of three she had swallowed lye with development of 'slight' esophageal stricture. During the following six months she had a series of esophageal dilatations at the Mayo Clinic in Minnesota. Since that time she had been absolutely well with no dysphagia or esophageal obstruction. On the night of December 16, 1944, the patient was celebrating her birthday, and following several cocktails she was enjoying a thick steak. She stated that she ate more rapidly than usual but, at any rate, she soon began to note retrosternal pain with dysphagia which soon progressed to complete aphagia. At the Permanente Foundation Hospital the diagnosis of esophageal obstruction by a foreign body (meat) was made, and the patient taken to surgery. Here, under local (2% pontocaine) anesthesia, a Jesberg short adult esophagoscope was passed, and the impaction found to be in the thoracic segment, approximately at the junction of the middle and lower thirds of the esophagus, 30 centimeters from the incisor teeth. With the grasping forceps the steak was removed through the esophagoscope. The postoperative course was uneventful, and the patient was discharged from the hospital on the following day. An out-patient department visit several weeks later revealed no further difficulties. *Case 3:* Patient R. J., a 31-year-old shipyard safety inspector, had a history of a lye stricture of the esophagus dating back to the age of three. In spite of a series of 67 esophageal dilatations, he was nevertheless forced to subsist chiefly on a liquid and semi-soft diet. On the evening of January 13, 1945, after an alcoholic bout, he began to eat a steak dinner late in the evening. About midnight he was admitted to the Permanente Foundation Hospital with the diagnosis of complete obstruction of the esophagus by meat. In surgery, under local anesthesia (2% pontocaine), a child's size Jesberg esophagoscope was passed to just below the cricopharyngeal pinch-cock where the upper end of the stricture began. Here, solidly impacted and completely occluding the lumen, lay a large mass of meat which was readily removed by the grasping forceps through the esophagoscope. The patient had no difficulty postoperatively and was discharged from the hospital on the following day. *Comment:* According to Jackson and Jackson the lodgment of a bolus of ordinary food in the esophagus is strongly suggestive of a previous narrowing of the lumen of an organic nature. Case 3 and presumably Case 2 are illustrative of this statement. However, the fact that

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The heart that feels not now, is dead:
The blood of his children
shall curse his cowardice,
who shrinks back at a time when
a little might have saved the whole,
and made them *happy.* THOMAS PAINE

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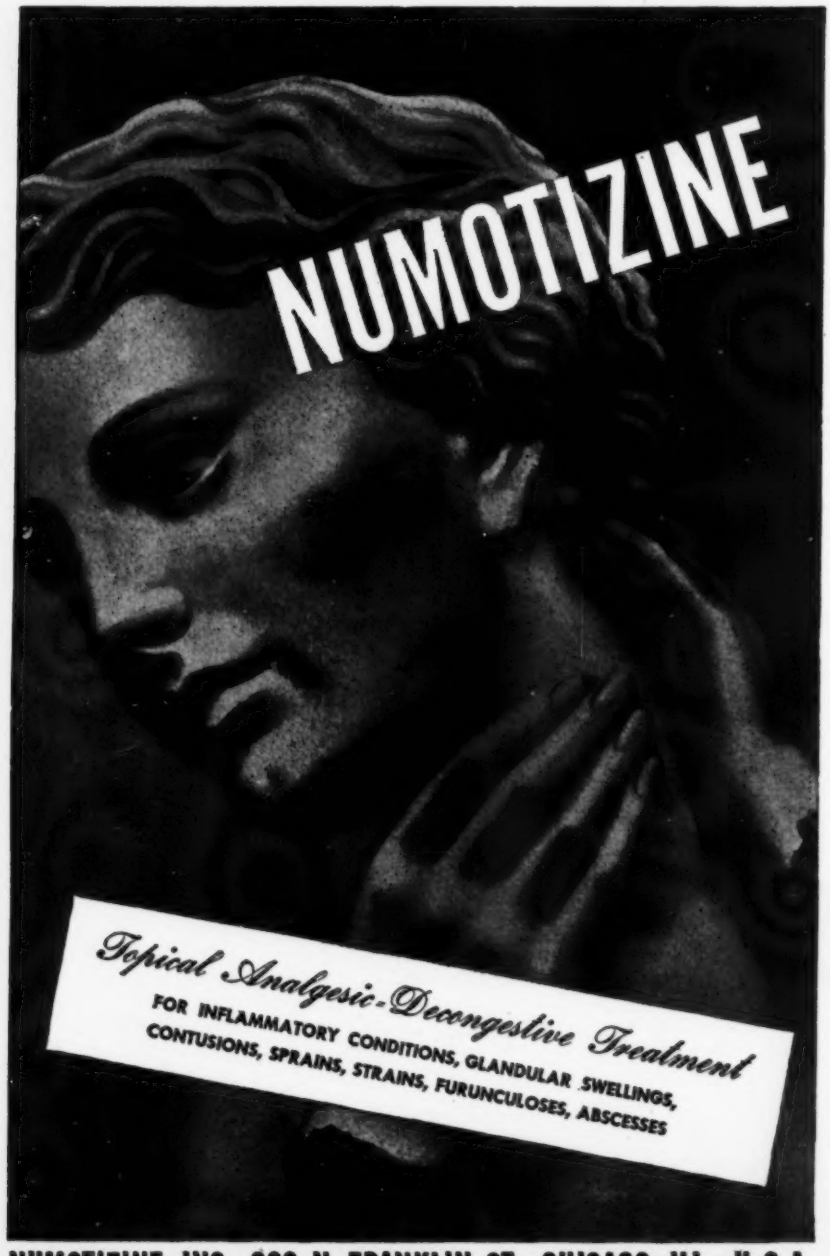
steak became impacted in a normal esophagus in Case 1 is unusual and certainly demonstrates that a large bolus of food, poorly masticated and hurriedly swallowed, may become lodged in a normal esophagus. The pre-disposing factors of carelessness and alcoholism are well recognized. Sites of lodgment are also of interest. It has now been well established that a large majority of foreign bodies are arrested in the cervical esophagus at the level of the superior aperture of the thorax, just below the cricopharyngeal fold. Only in Case 3 was this demonstrated here, and the basis for the site of arrest, of course, was the cicatricial narrowing of the esophageal lumen. In Case 2 the lesser constriction afforded by the crossing of the left main stem bronchus and the aorta apparently were contributory to the occlusion in the thoracic esophagus. The patient with a normal esophagus (Case 1) had his foreign body arrested only just above the hiatus esophagus, apparently successfully surmounting the gamut of the cricopharyngeus and thoracic esophageal constrictions. It may be presumed that cardiospasm or achalasia was present though subsequent studies did not demonstrate this. In all of these cases the presenting complaint was a constant deep-seated sense of retrosternal discomfort or pain. Aphagia with regurgitation of all foods or fluids was present in all three cases. Diagnosis was comparatively simple with the history as the chief aid. Barium esophagrams were of value in localization of the site of arrest. In the present status of peroral endoscopy, there is only one method of treatment, namely, esophagoscopic removal. The now archaic use of a probang or blind bouginage to dislodge such foreign bodies could not result in disaster such as rupture of the esophagus with mediastinitis and death. *Summary:* Herein are reported three cases of complete esophageal obstruction by meat as a foreign body. Cure in each patient was effected by peroral esophagoscopy and removal of the foreign body."

1. HOLLINGER, P. B., ANDREWS, A. H, and RIGBY, R. G.: Foreign Bodies in the Air and Food Passages. *The Eye, Ear, Nose & Throat Monthly*, 22:415, November, 1943.

2. JACKSON, C., and JACKSON, C. C., Bronchoscopy, Esophagoscopy & Gastroscopy. Philadelphia, W. C. Saunders Co., 1934.

From *Permanente Foundation Medical Bulletin*, 3:2, April, 1945.



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Radiography Revelations

DR. HERMAN E. HILLEBOE and DR. ARTHUR W. NEWITT, Washington, D. C., "Small Film Radiography in Industrial Groups," in *The Journal Lancet* (65: 4, 134-136) April, 1945. Extract: "In the course of mass x-ray surveys in industry, a number of chest conditions other than tuberculosis were encountered. The discovery of non-tuberculosis pathology forms a valuable by-product of this work. Gould, of the U. S. Public Health Service, made a study of non-tuberculosis lesions found among 442,252 chest films of a selected group of apparently normal persons working in large industries, principally shipyards and government-owned arsenals and depots. The group surveyed must not be considered as a representative sample of the adult population. The results, however, do give some indication of the non-tuberculosis chest pathology one may find by routine 35 mm. and 4 in. x 5 in. mass radiography. All diagnoses were based upon 14 in. x 17 in. confirmatory celluloid films taken on persons with abnormal or suspicious small films. The analysis of this selected group of 442,252 films revealed 4,982 (or 1.1%) with evidence of non-tuberculosis chest pathology; 66 different categories of chest lesions were listed. It is interesting to note just a few of the more common findings: abnormal hearts, 2,652 (one in 167), pneumoconiosis 261 (one in 1700), suspected bronchiectasis 252 (one in 1800), mediastinal mass 52 (one in 8500), dextrocardia 40 (one in 11,000). Several uncommon cases were discovered also, including: dermoid cyst, five cases; calcification of pericardium, three cases; echinococcus cyst of the heart, one case (confirmed clinically). The majority of individuals with these non-tuberculosis lesions were unaware of their disease. It was surprising to note how extensive some of these chest lesions had become without producing symptoms sufficient to cause the individual to seek medical advice. It was gratifying to detect numerous chest tumors in early and remediable stages, when modern surgical measures could be successfully employed. Thus, the by-products become nearly as valuable as the main objective, in mass radiography of the chest. . . . It is essential to examine all present employees and all new employees and to make periodic examinations at reasonable intervals of the entire working force of an industry in order to discover and control new cases as early as possible. Careful clinical study will then provide a sound medi-

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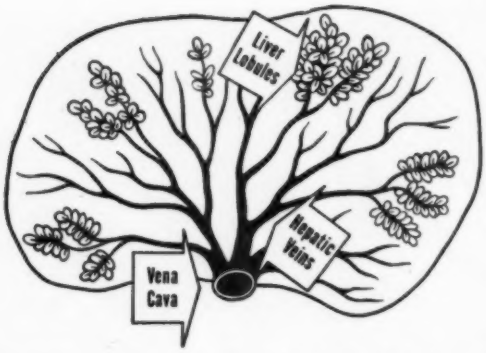

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cal basis for the immediate and ultimate disposition of each person suspected of having pulmonary tuberculosis. Depending on the extent of the lesion, presence or absence of activity and work capacity of the individual, definite placement plans can be made for continued employment under medical supervision or interruption of work if isolation and treatment are indicated. Care must be exercised in the diagnosis of minimal lesions and the determination of their activity. Many employees have been penalized unnecessarily because of hasty conclusions drawn from the interpretation of a single flat plate of the chest. The more one sees of so-called minimal lesions on x-ray films, the more cautious one becomes in their interpretation. It has been found that competent readers often differ in their impressions of the activity of a lesion on a particular film. Indeed, it is true that a reader will not always make the same conclusion in interpreting the same film on two different occasions. The only safe rule to follow is careful clinical study, including examination by gastric lavage and tuberculin tests if indicated, before differential or final diagnosis is made. It may be necessary often to wait three to six months for comparative clinical study and examination of serial x-ray films before a definite diagnosis or determination of activity can be made. Effective tuberculosis control, especially in industrial groups, requires a sound program of rehabilitation. Industry and the community must accept this responsibility jointly. Temporary and permanent sheltered employment will be necessary. The English have demonstrated the effectiveness of practical measures such as the industrial colony, the training colony, and the local workshop. This aspect of the tuberculosis problem presents many difficulties, but these can be overcome if full use is made of our tremendous and varied resources. Because the problem is social and economic as well as medical, and requires the aid of all community groups for successful solution, other groups besides the medical profession are sooner or later drawn into the picture. The wisest plan is to enlist the aid of such groups from the beginning. Sharing in the planning of a program will result in a sharing in responsibility for its success as well. The local sanatoria, the voluntary tuberculosis association, welfare agencies, management, labor, and rehabilitation groups have definite contributions to make, and can render invaluable aid to the health department and private physicians. The industrial group is only one part of the population, and should be given consideration in direct proportion to the extent of its problem as it touches the community as a whole."

Abdominal Symptoms

DR. W. H. WITT, Nashville, Tennessee, "Abdominal Symptoms Not Due to Abdominal Disease," in *Kentucky Med. J.*, May, 1945. Extract: "Patients with nervous dyspepsia, no matter how intelligent, rarely tell a very straightforward consistent story. The purely digestive symptoms are jumbled up with symptoms referable to other organs and there is great difficulty in keeping the patient on a purely digestive recital. Also when it comes to such important data as relation to food, and amount and kinds of food, periods of comfort, how complete and low long they last, we often have to give up in despair. This fact alone should suggest that we branch out in a much wider field of inquiry and uncover the patient's entire personality and his reaction to the various vicissitudes of life. Such patients will frequently have eliminated various foods and reduced the amount of food taken until the result is that he is much below normal weight with consequent loss of endurance, loss of muscular tone, one effect of which is general visceroptosis; there will probably be constipation, headache, backache, fatigue, various vasomotor and other symptoms referable to an upset autonomic nervous system. Some of these are the result of a lowered state of nutrition from under feeding, and some have always been present and are a part of this patient. It is in this group that spastic colon with the enema habit is apt to be developed. In fact spastic colon with its rumbling and growling, and even pain, constitutes a leading factor in producing the symptoms of which I am speaking. As is well known, such physical and nervous wrecks do not always complain most of their digestive troubles; just as often it will be one of the other symptoms just enumerated that is put forward as

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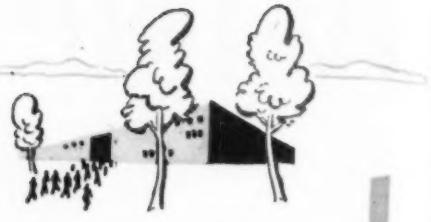

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the chief complaint. The family history is nearly always clarifying and confirmatory, though other members of the family may have had a few or none of the symptoms most complained of by the patient under examination. And I may say that in all baffling cases of abdominal symptoms, particularly symptoms that seem to involve the digestive tract the family history should be taken first. It is by all means the best way to get a line on the patient's background. Uncovering such a family history serves to impress the fact that while dyspepsia may be the presenting symptom, the one that the patient observes most, it is really only one of a wide range of abnormal sensations, the very multitude of which suggests the absence of organic basis. But it must be borne in mind that the patient will not detail these other symptoms unless they are inquired after. Such a quizzing includes uncovering the patient's reaction to all the conditions of life and work. Is there debt, or worry, unhappiness from any cause, loss of sleep, uneasy conscience, disappointment in love, ungratified social aspirations? The doctor who misses these psychic reactions may not only fail to get at the cause of symptoms, but is sure to fail in his therapeutic efforts. The more patiently these matters are brought into the light and the more pointedly the doctor can predict the patient's other symptoms referable to the nervous system, the more apt he is to gain the confidence of the patient."

Connecticut Committee

REPORT of the Committee on Industrial Health (Connecticut), C. F. YEAGER, Chairman, in *Connecticut State M. J.*, May, 1945: "The year just completed has been one of progress for this Committee. There were eight regular scheduled meetings and 18 subcommittee meetings. During the past year, both industry and labor have become more interested than ever before in occupational health. This interest was primarily due to the demands for increased production by the armed forces, in face of an already serious manpower shortage. Whereas industries in general were meeting their production quotas a year ago, the armed forces during this past year suddenly found that production was waning as a result of the rapid strides made by the allied armies. We are told that the advances were far beyond the expectations of the experts. More people had to be employed. Many had never before worked in industry, such as, housewives, clerks, farmers, salesmen, storekeepers, etc. In addition, there was an increase in shifting populations; and housing and transportation became more difficult. Industry was faced with an acute shortage of certain raw materials which necessitated the use of substitutes, as to some of which little or nothing was known regarding their effects on the health of the worker. Also, during the past year, industries in Connecticut have reabsorbed thousands of returning veterans, many of whom had to be retrained and rehabilitated. This was a difficult problem for the reason that many of the legal aspects needed interpretation and clarification. Finally, the armed forces were demanding and taking more nurses, including those already employed in essential industries. All of the above problems and many others too numerous to mention have either directly or indirectly been referred to this Committee for their advice and assistance during the past year. The most outstanding accomplishment of the year was the joint Industrial Health Conference with the State Manufacturers Association, held in New Haven, December 14, 1944. Upwards of 350 attended the sessions. The program was designed to bring out all aspects of the returning veteran into industry, although many phases of present-day occupational medicine were covered. This was the second joint meeting with the Manufacturers Association, the first one on May 7, 1942. The meeting was a huge success, and it was suggested by many of those who attended that meetings of this type should be held annually. Early in the year the Committee was requested to develop a procedure which could be used as a guide by industry controlling the employment of pregnant women. After several

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meetings with a committee of obstetricians, a plan was submitted to the Manufacturers Association, setting forth guiding principles for the employment of pregnant women. This was later published by the Manufacturers Association and the *Connecticut State Medical Journal.* This Committee has assisted in the development of industrial nursing courses and lectures at the University of Connecticut in Hartford, and at the St. Mary's Hospital School of Nursing in Waterbury. Many of the members of this Committee prepared and gave the lectures. Those given at the University of Connecticut, were post-graduate courses. Both were huge successes and both plan to continue them. During the past year this Committee has received numerous requests from industry to help them develop or expand their plant medical facilities. In order to do this, surveys were made at the plant, following which specific recommendations were submitted. The Committee was requested by the State Secretary to study and comment on Bill 361, An Act Concerning Trained Attendants. After careful consideration the Committee unanimously voted opposition to it. At the request of the Council of the State Medical Society, the Committee studied a report of the Committee on Workman's Compensation Laws of the New London County Medical Association, and after careful consideration and a comparison with a similar report submitted by Dr. D. Chester Brown in 1935, the Committee declined to endorse some of the recommendations. The Committee has prepared or procured articles for publication in the state medical journal throughout the past year, and has also provided speakers for both medical and lay groups on the subject of industrial medicine. The Committee has had the pleasure of working with the Yale University School of Medicine in the development of a plan to broaden the teaching and research facilities of industrial medicine."

Psychiatric Aspects

LT. COLONEL WALTER O. KLINGMAN, MC, AUS, "Some Psychiatric Aspects of Nervous System Injuries," in *Bulletin of the New York Academy of Medicine,* May, 1945. Summary: "Out of the war-time experience have arisen certain facts for emphasis. Many individuals developing disabling neurosis after head injury suffer from latent or active neurosis before exposure to military life or from neurosis incidental to the war experience. The patient's history frequently gives evidence of previous neurosis, psychoneurotic and neuropathic traits, unsatisfactory sexual adjustments, marked mood swings, seclusiveness, schizoid characteristics, extreme rigidity, excessive timidity, childhood fears, parental dependence, asocial acts, and previous psychological traumata. Individuals with such characteristics in their make-up should not be considered for either military or civil assignments where the elements of special danger and personal physical risks are great. Industry can well afford to profit by methods of selection of prospective employees for such jobs and positions similar in purpose to those used by the armed forces in selection of personnel for highly dangerous and hazardous undertakings, specifically such as in the flying and submarine branches of the service. Even if a psychiatric staff cannot be employed or provided, the development of psychologist selection staffs should be encouraged. The specific psychological tests and appraisals now available leave no excuse for haphazard selection of such employees. In conclusion, several valuable psychiatric factors have been introduced in the management of nervous system injuries by the experiences of this war. Prophylactic psychotherapy during the management of the immediate post-traumatic phase had reduced persistent disability prospect. Application of short term techniques of therapy based on psycho-analytic principles, followed by sound rehabilitation programs has been most helpful in the treatment of nervous system injuries with subsequent neurotic expressions. Diagnostic and prognostic aids from psychological testing, electroencephalography and air encephalography may be necessary in the full appreciation of either structural damage or the psychoneurotic state. Those cases with mixed pictures of organic and functional disturbances require management according to the merits of their particular cases, either by prolonged psychotherapy, programs of rehabilitation or by the protective environment of institutional life."

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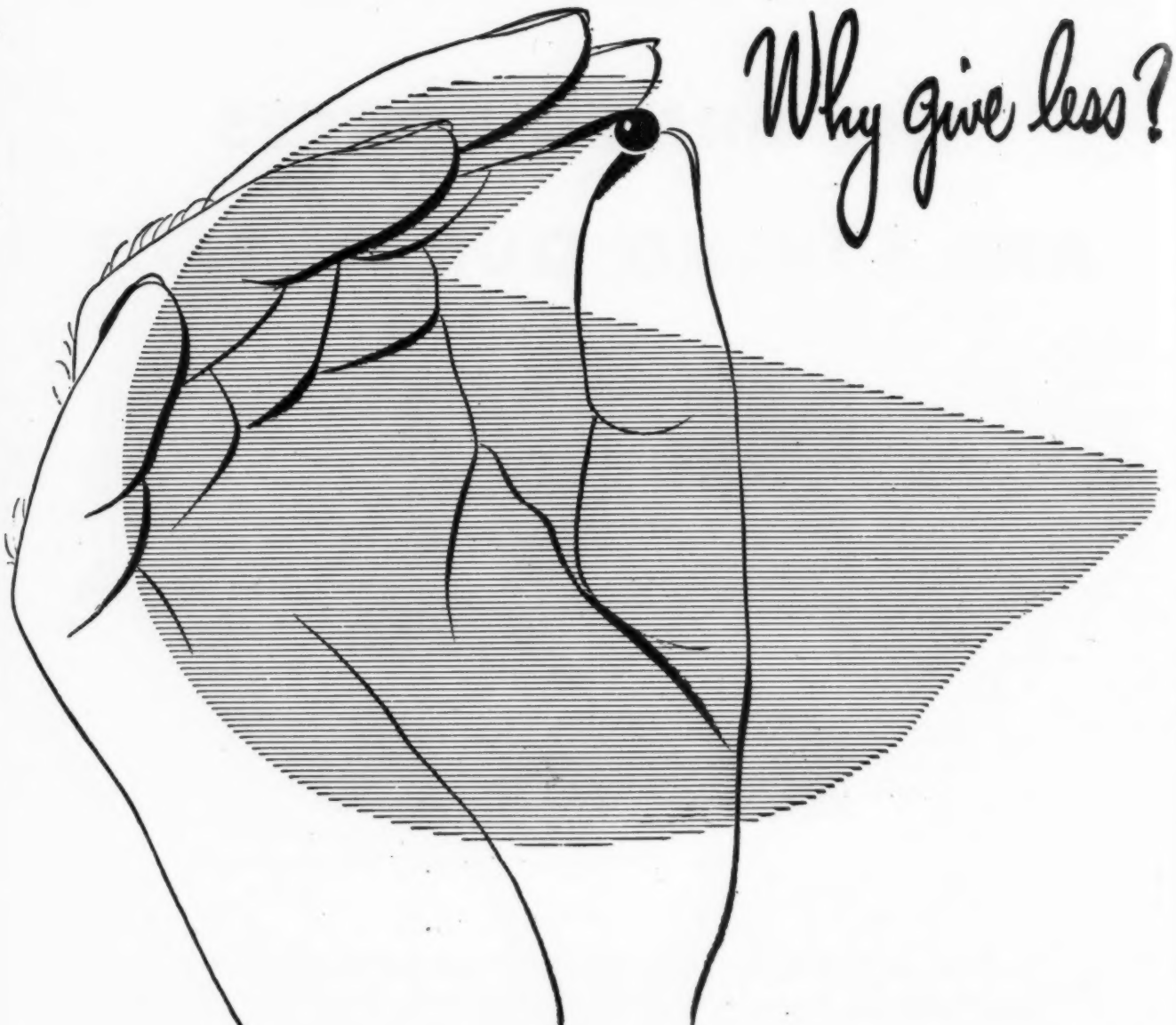

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Industrial Medicine

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The Journal of Industrial Health, Occupational Diseases and Traumatic Surgery

With which are consolidated "The Industrial Doctor" and "International Journal of Medicine and Surgery."

The Science, the Law and the Economics of Industrial Health

Volume 14 June, 1945 Number 6

Aluminum Therapy in Silicosis

—A Clinical Study of the Comparative Effects of the Metallic Powder and Hydrated Alumina—

PAUL J. BAMBERGER, M.D.,
Bethlehem, Pennsylvania

From a theoretical point of view the elimination of silicosis as an industrial medical problem should be relatively simple since its cause has been definitely established and the methods of prevention are well understood. Yet actually the disease is far from eradicated, for new cases are appearing with disconcerting regularity even in those industries in which industrial hygiene programs have reached a high degree of development. In recent years experimental observations of great significance have been made which suggest a new approach to the problem of preventing the disease, and offer some promise of relief to the silicotic patient as well.

In 1937, Denny, Robson and Irwin[1] reported the results of their investigations into the inhibiting effect of metallic aluminum powder on the development of experimental silicosis in laboratory animals. They found that about 1% of the aluminum powder when mixed with quartz would prevent the usual fibrotic effect of the quartz. In a later paper[2] they reported the results of further experiments which indicated that although intimate contact of the aluminum with the silica particle is essential, the two dusts could be inhaled independently with thoroughly satisfactory results. Of further significance in its application to the problem of human silicosis was the apparent mildness of the reaction to the aluminum in the lungs and the absence of any toxicity or damage to the tissues. They concluded that aluminum exerts its inhibiting effect on the toxicity of quartz chiefly by coating the quartz particle with an insoluble and impermeable coating of gelatinous aluminum hydroxide. Germer and Storks[3] identified this in dried films as the crystalline alpha monohydrate of aluminum, but since the latter substance does not inhibit quartz, some alteration undoubtedly takes place on drying.

Further evidence of the harmlessness of aluminum powder is supplied by the aluminum industry in this country in the manufacture of aluminum powder for the paint and ink industries. There has been no confirmation reported in this country of a condition described by Goralewski[4] as the "aluminum lung," and although there have been cases reported of asthma due to the inhalation of aluminum dust such as that described by Cotter,[5] such examples of sensitivity to aluminum are undoubtedly rare.

Denny and his co-workers did not speculate on the possible therapeutic significance of their findings when applied to human silicosis, but the failure of any other agent to influence the disease and the apparent harmlessness of the powder gave ample justification for its clinical trial. Crombie, Blaisdell and MacPherson[6] treated 34 selected cases at Timmons, Ontario, and found that 55% of them obtained subjective improvement while 35% evidenced some improvement in their functional tests. Even more striking is the experience of Hannon[7] whose subjects are exposed to dusts containing tridymite and crystobalite. He treated an initial group of 33 selected cases and obtained improvement in every case. He then treated an additional group of 247 men with positive x-ray findings, 143 of whom had disability. Of those who had disability 94% were improved, while about 90% of those who denied disability claimed improvement. Only two cases felt they were worse after treatment. Hannon concludes that the rapid type of silicosis is particularly responsive to aluminum therapy.

Working independently of the Canadian observers, Gardner[8] and his co-workers had been trying to coat quartz particles with iron hydroxide as suggested by the work of Kettle[9] in 1932. Although iron did not prove satisfactory, this work led to the discovery that a colloidal aluminum hydroxide, which they prepared effectively inhibited the reaction to quartz in their injection experiments. They were then able to obtain an amorphous hydrated alumina which was suitable for dusting experiments and which duplicated the excellent results obtained by Denny and his co-workers with metallic aluminum powder. They pointed out that aluminum hydroxide possesses certain advantages over the metallic powder, and reported two cases treated with their powder with good results in one case. They felt that the hydrate deserved serious clinical trial.

The present study was undertaken as a preliminary to the introduction of aluminum prophylaxis in a large non-ferrous metal mining industry in Colorado. It seemed desirable to determine whether the favorable therapeutic results obtained by others could be duplicated here, and also to determine whether hydrated alumina possesses advantages over the metallic powder which might warrant its use in preference to the latter substance.

Material

FIFTY men were selected for the study and 49 of them completed the course of treatment which was outlined. The men were selected only in the sense that it was impossible to use all the men who wanted to take the treatments, and those with minimal pulmonary reaction to dust were not treated. None of the men studied had evidence of active tuberculosis, none was totally disabled and all were working seven days a week at an altitude of 11,500 feet. Most of the men were still actively engaged in mining, and in no case had a man been free of dust exposure for more than two years. The rock in which they worked varied widely in its silica content, averaging about 75% in total and 45% in free silica. Petrographic analysis of a sample of the dust yielded 40 to 50% quartz, 25 to 35% muscovite, 10 to 20% feldspar (orthoclase), and 5 to 10% miscellaneous minerals. The type of silicosis resulting from such a dust is typical of that which is found among hard rock miners in the West in that it is a relatively pure form with little evidence of modification by inert or inhibiting dusts.

The men were classified according to the degree of pulmonary fibrosis into three stages of silicosis and a stage of presilicosis which is characterized by exaggeration of the broncho-vascular shadows up to but not including the stage where discrete nodules could be identified in the x-ray. Thirteen such presilicotics were studied who averaged 34 years of age and had been exposed to quartz dust for an average of seven years. In the silicotic group there were 36 men whose average age was 41 years and average exposure period was 11 years. There were only seven men in this group who were over 50 years of age, four of whom had third degree silicosis. This indicates an unusually young age group and suggests a fairly rapidly developing silicosis. The frequency with which symptoms occurred in each classification is shown in Table 1.

TABLE 1.
FREQUENCY OF SYMPTOMS

Symptoms	Pre-Silicosis (13)	1st Degree Silicosis (22)	2d Degree Silicosis (5)	3d Degree Silicosis (9)	Totals (49) No. men	Per cent
Cough	8	16	5	8	37	75
Dyspnea on exertion	6	12	5	8	31	63
Chest pain (all types)	3	10	2	6	21	43
Poor appetite	3	4	4	3	14	28
Weakness	1	3	3	4	11	22
Dizziness	0	4	2	3	9	18
Sleep difficulties	0	2	2	4	8	16

Since all of the men had previously been examined at yearly intervals, a rough estimate of their functional abilities had been made before the study was undertaken. This was found to be helpful in evaluating the effects of treatment.

Methods

BEFORE treatment each man was given a thorough physical examination which included an exercise test. Stereo chest x-rays were taken and an electrocardiographic record made. Laboratory studies included the usual examinations of the blood and urine, Kahn test, sedimentation test, routine tuberculin test and sputum examinations when indicated. An accurate history of symptoms was obtained and all the data were recorded on an 8½ by 11 inch card, the reverse side of which contained a record of each treatment together with any comments which the men cared to make during the course of treatments.

Upon completing the course each man was asked to comment on the results of the treatments, and specific questions were asked concerning those symptoms of which he had complained. From one to two months after treatment the men were re-examined and again questioned about the results they had obtained. Few discrepancies were noted, but those cases in which a man changed his mind about having received benefit, and those in which the man was no longer certain of his improvement were recorded as unimproved.

Thirty treatments were given, starting with an initial treatment lasting five minutes, and increasing by five minutes daily to a maximum of 30 minutes. The men were required to stand while taking the treatments and were instructed to inhale the powder slowly with near-maximum inspirations. Metallic aluminum powder was administered to 25 men; seven with presilicosis, 13 with first degree, two with second degree, and three with third degree silicosis. An aluminum mill was employed which was similar to that described in their paper by Crombie, Blaisdell and Mac Pherson[6] except that by using a three-way outlet on the settling bottle it was possible to treat three men at one time.

Hydrated alumina was given to 24 men; six with presilicosis, nine with first degree, three with second degree, and six with third degree silicosis. The powder, XH-1010, was obtained from Dr. Francis C. Frary, Director of the Research Laboratories of the Aluminum Company of America. It is a very fine white amorphous powder as compared with the metallic form which is coal black, and was administered by means of a very simple apparatus which was copied in the laboratory from one provided by Dr. Leroy U. Gardner.

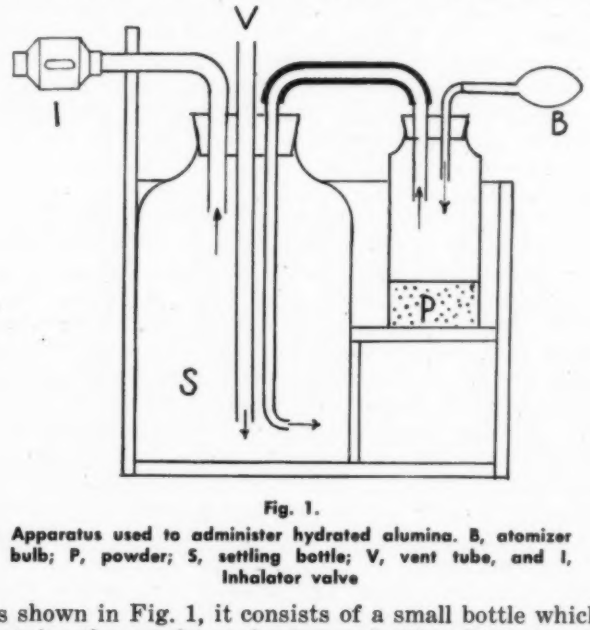

Fig. 1.
Apparatus used to administer hydrated alumina. B, atomizer bulb; P, powder; S, settling bottle; V, vent tube, and I, inhalator valve

As shown in Fig. 1, it consists of a small bottle which contains the powder and a larger bottle which acts as a settling and diluting chamber. The rubber atomizer bulb produces a stream of air which agitates the surface of the powder and carries a faint cloud of it over into the large bottle where the larger particles and agglomerates settle out while the finer particles are diluted with air entering through the vent tube as the patient inhales. Very little practice was required until the men were able to manipulate the bulb so as to produce a satisfactory concentration of the dust.

Results

WHEN the men were asked to state whether they were or were not improved by the treatments, of those who took metallic aluminum 13 said they felt better, nine could see no change, and three felt they were worse. Of those who received hydrated alumina

11 felt better, 11 were unchanged, and two thought they were worse. The effect of the two powders in alleviating specific symptoms is shown in Table 2.

TABLE 2.
COMPARISON OF THE RESULTS IN ALLEVIATING SYMPTOMS

Symptoms	Metallic Aluminum (25)				Hydrated Alumina (24)			
	No.	Improved	Same	Worse	No.	Improved	Same	Worse
Cough 17	3	11	3		20	11	8	1
Dyspnea 14	6	7	1		17	7	7	3
Chest pain 11	3	8	0		10	5	5	0
Poor appetite.. 8	3	5	0		6	1	5	0
Weakness 6	2	4	0		5	2	3	0
Dizziness 5	0	5	0		4	0	4	0
Sleep difficulties 3	2	1	0		5	3	2	0
Totals 64	19	41	4		67	29	34	4

which reveals that hydrated alumina was effective in relieving 29 out of 67, while metallic aluminum relieved 19 out of 64.

The comment made by the men during the course of treatments reveals that a significant number of them experienced some discomfort from the inhalation of both types of powder. This discomfort was manifested principally by excessive coughing which lasted for from one to two hours after treatment. In some cases the men complained of a feeling of fullness in the chest, while others said they felt as though "catching cold." Nausea and transitory shortness of breath occurred in a few cases, but none of these symptoms was sufficiently severe to justify interruption of the treatments. Most of them occurred early in the course and subsided before the course was completed. Some discomfort was noted in 12 men who took metallic aluminum and six who received the hydrate. Subsequent experience suggests that a treatment period of five to 10 minutes is likely to produce good results with less irritation to the respiratory tract.

Observations indicate that aluminum therapy is productive of better results in the pre-silicotic and early stages of silicosis than in the more advanced cases, although some individuals in all the categories claimed improvement. The effect of the powders on the normal individual was not studied, nor was it possible to use a placebo to assess the psychological effects of the treatments. While two cases of third degree simple silicosis claimed remarkable results from the hydrate, little improvement was claimed by those men with conglomerate lesions. Of the 13 who claimed benefit from the inhalation of metallic aluminum three were pre-silicotic, seven had first degree, two had second degree, and one had third degree silicosis. Of the 11 who were improved by the hydrate three were pre-silicotic, four had first degree, two had second degree, and two had third degree silicosis.

Re-examination of the men after treatment failed to disclose any significant improvement in the response to exercise. On the other hand, one man with third degree conglomerate silicosis showed a definite reduction in performance. An increase in vital capacity shown by six men was offset by a slight reduction in that of 27 others. Careful examination of the chest x-rays likewise failed to reveal any significant changes.

It should be remembered that the optimum dosage of neither form of aluminum has as yet been established and that the dose used in this study is an arbitrary one. However, incomplete data on a number of men who have taken more than the 30 treatments prescribed seems to indicate that maximum subjective improvement is attained by the time 15 to 30 treatments have been taken. Additional treatments are to be given at regular intervals, but it is not expected that these will result in further improvement.

Summary and Conclusions

A REVIEW of experimental studies on the use of aluminum powders reveals a rational basis for their application to the prophylaxis of human silicosis, and the clinical experience of others suggests that the metallic powder is effective in alleviating the symptoms of the disease.

In the present study of 49 miners treated with aluminum, of whom 24 received hydrated alumina, it would appear that the hydrate is similarly effective in producing subjective improvement. Twenty-four out of the 49 claimed some benefit from the treatments, 13 from the metallic powder and 11 from the hydroxide. In no case was objective improvement noted.

The hydrate was found to have certain advantages over the metallic powder which suggest that it might well be used in preference to the latter. The hydrate is a white powder and is less objectionable to the men than the coal black metallic form. It seems to be less irritating to the respiratory tract as evidenced by the fact that it caused less discomfort by its inhalation, and it is easier to administer in that being stable it does not require a bulky mill to produce it as does the metallic powder.

From the results obtained in this study the following conclusions may be drawn:

1. Hydrated alumina and metallic aluminum both seem to be effective in relieving the symptoms of silicosis in a significant number of cases.

2. A material difference in the effectiveness of the two powders, if any exists, can not be determined from such a limited series of cases.

3. Ordinary clinical methods are inadequate to reveal improvement in work performance following the treatments.

4. The hydrate seems to be superior to the metallic powder for the treatment of silicosis and deserves further clinical trial.

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Certificates

CERTIFICATES for satisfactory completion "of a course of treatment for Treponema Pallidum" are being used by a shipbuilding company in North Carolina as a case-holding device among infected employees. The medical examiner of the shipbuilding company reports that the certificates have been especially useful in encouraging infected negro workers to complete treatment. The company employed more than 22,000 persons at its peak of operations, and, in the course of routine blood testing of employees, there were discovered more than 2,500 whose serologic tests for syphilis were positive.

VD War Letter, May 25, 1945.

The Modern Concept of Psychiatry

—In Industrial Medicine—

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AMERICAN industry, admittedly the most forward looking in the world, has seen fit, during its evolution, to surround its workers with a cushion of medical care. You may be sure that this has not arisen for any reasons of altruism or idealism. It was simply in the interests of efficiency, and—efficiency is good business.

Production is the goal of business. Its frailest link is the human being. Any safeguards that might be erected around that human being, must by the simplest process of reasoning, provide a better producer. Hence industrial medicine, that branch which stands guard over the immediate contact between the worker and his job.

Through the years when industry was making America, through the pains of industrial childbirth and the growing pains, the idea that the well-being of an individual must eventually contribute to the sum total of production gradually took shape.

It is no accident, therefore, that industrial medicine, in its present highly organized form, has become an active partner in industrial enterprise. For, by its very presence, it gives the worker a sense of minute-by-minute security, physical and mental—that no financial device can offer. It represents his *physical*, and, in large degree, his mental security. Can anything be closer to life itself?

Whether his is a treasury check or a corporation check, the worker is entitled to exactly the same degree of care as his health, physical and mental, relates to his job. Mass employment, after all, has evolved certain quasi-social and physical standards, that have been well tabulated and vary little whether they occur in government or private enterprise.

In its application as it specifically refers to my own organization, it works as follows:

1. We maintain a high degree of friendly cooperation with the practicing physician in the community.
2. We supply the physician with the reports of every diagnostic aid possible—x-rays, EKG, blood chemistry, serology, urinalysis, basal metabolism.
3. When the need arises, we consult with the physician to assist him in arriving at proper treatment of the patient by giving him the results of all our observations.
4. We assist in securing adequate and proper hospitalization for the employee—but we do not interfere with the selection of consultants or hospitals.
5. If impairments are discovered in pre-employment examinations, we use every effort to direct the applicant to proper medical supervision and care. As a result of this procedure, many patients get to private physicians who would otherwise not arrive there.
6. In emergencies, whether physical or mental, we are prepared to handle the situation until the normal outside medical agencies can take hold with our full cooperation.

These functions do not, of course, take in the myriad bandaging of an injured finger, the suggestion of a laxative or the just general medical pat on the back. They are meant to outline the broader relationship of the industrial physician to his co-worker.

I have said that industrial medicine by its existence has a definite effect on general morale, but I feel it must go further. The psychiatric aspect in this field has unfortunately, been barely scratched in this country. We have lagged behind other nations, notably England, Norway, Sweden, and our enemy, Germany. A full record of their work in this field is too lengthy to enter into, but literature is readily available if desired.

As a case in point, I would like to state at this time that the fine record made by British workers under stress of direct attack was due, in no small part, to previous preventive psychiatry. Our own defection in this field has been rather sadly pointed up by the number of neuro-psychiatric rejections under Selective Service.

Lest I be suspected of special pleading for one of the newer phases of industrial medicine, it seems proper that I give you as reasonably exact an idea as I can of the functions of an industrial psychiatrist. This definition is provided out of 13 years of experience as a practicing industrial neuro-psychiatrist with my organization employing 50,000 persons. Industrial psychiatry is a phase of preventive medicine. It aims to forestall and prevent serious mental and emotional maladjustments among industrial employees.

The definition, however, is not offered as conclusive functionally, but is simply my own version, painstakingly evolved by trial and error over the years, and over what has been heretofore an uncharted sea. Industrial psychiatry, as any other psychiatry, is not and can never be an exact science. I prefer to consider it an *emotional first aid station*. As such, the functions are those of an industrial physician with special neurological and psychological training.

As an integral part of a medical set-up, industrial psychiatry demands first, full medical understanding, plus a "zone of neutrality" in which the employee's normal woes may be sorted out from real afflictions—mental or physical. It would amaze most people to know how much sand the imaginary woes can throw into the gears of industry. An imaginary stomach ache can cause just as much organizational damage as an incipient cancer.

I am an integrated part of a medical organization operating under and with the medical chief, and, while the foregoing does not exclude additional psychological techniques of proved worth that can be brought to bear, it does contain the functional germs within the organization.

As I have previously stated, industrial psychiatry is a form of preventive industrial medicine. The old concept of psychiatry was that of a pathological approach—the individual must be quite ill before the psychiatrist would see him. The newer veiwpoint is that of the preventive approach—in my own office, every employee who comes to see me is considered a normal employee with a problem until proved otherwise.

Industrial psychiatry must never be used as a means of keeping people out of work, but is rather a tool that is used to better fit a person to his job (to be used both in placement and supervision).

Probably one of the greatest reasons for emotional first aid to industry is that an adjusted worker is far more alert and efficient and he is rarely absent from his job. About 90% of industrial accidents are due to personal factors, such as carelessness, apathy, inattention, fear and worry.

Bring mental health to the employee, place him where his abilities fit, give him some concrete proof that we like him and value his ability and we, as a society, shall have a measure of control over the dangers of industrial life which now seems unbelievably improbable.

Given at the Long Island College of Medicine Third Postgraduate Course in Industrial Medicine, October-November, 1944.

The Modern Concept of Psychiatry

—And its Place in a Medical School Curriculum—

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PRIOR to the early years of the twentieth century psychiatry was a medical specialty practiced mainly within the confines of mental hospitals or asylums, as these were known in those days. The mentally ill, or the lunatics and insane as they were then called, were cared for, treated and studied by the psychiatrists of the nineteenth century who laid the foundation on which modern psychiatry has been erected. Ebaugh and Rymer have called the pre-twentieth century era of American psychiatry, "Psychiatry in Isolation," that is, a relative isolation of psychiatry from medicine and mental hospitals from universities; a period characterized by dominance of the organic point of view, an ignorance of the dynamics of mental and emotional life, and by a type of teaching which was didactic, descriptive and largely in terms of the insanities.

Thus it is clear how, in the mind of the laity and a good many of the medical profession, psychiatry is erroneously conceived of as a specialty that deals exclusively with the obviously mentally ill or insane.

Unfortunately, it comes as a surprise to some doctors, as well as to many of the laity, to learn that present-day psychiatry covers a far more extensive field than mental diseases per se.

Modern psychiatry had its inception when man was rediscovered as a biological organism with protective and reproductive drives, with a complex structure known as a forebrain, and living and functioning as a unit in a complicated, often baffling social order.

Freud and his analytic psychology, with its distinctly socio-biological orientation, marked the birth of modern psychiatry. He saw in the mind of man, first, a means through which the protective and reproductive needs find an infinite variety of expression at psychological levels; second, the psychological representation of the racial and personal social experience; and third, the center of the coordinated and executive forces in human behavior.

As both a direct and indirect influence of Freud on psychiatric thought, the emphasis on the role of personality in social and economic maladjustment and more recently in somatic illness became the dominant trend in American psychiatry. As the late C. Macfie Campbell has said, "The problem of the psychiatrist is no longer to identify a clinical picture but to get to grips with the actual dynamic situation and to reconstruct, in detail, the life history with attention to the sensitizing or conditioning influence of environmental factors." Campbell goes on to state, "Since knowledge of the personality derived from the clinic was valid for the personality in all human relations, psychiatry has stepped outside the clinic to survey the field of human relationships in general." This trend of American psychiatry so well described by C. Macfie Campbell provided a foundation remarkably suited to the mental hygiene movement instituted by Clifford Beers, sponsored by Adolph Meyer and directed by Thomas Salmon, under the aegis of the National Committee for Mental Hygiene. Although the initial objective of the National Committee for Mental Hygiene was the improvement in the care of the insane, its program underwent rapid expansion, largely in the direction of mental hygiene education. Three aspects of its mental health program have had a profound and telling effect on American psychiatry. These were:

1. The child guidance movement in which the study of the child during the developmental period of life in the setting of the home, neighborhood and school, in sickness and in health, served to elicit much valuable information concerning the needs of the growing personality and how reaction patterns are set up and become integral forces in human life responses and behavior.

2. In conjunction with the American Psychiatric Association, the National Committee for Mental Hygiene under a grant from the Commonwealth Fund, conducted extensive surveys in under-graduate psychiatric instruction in the medical colleges throughout the country and later made available, through Ebaugh and Rymer's "Psychiatry in Medical Education," the policies and programs of psychiatric departments of various medical schools.

3. Enlarged programs of psychiatric education in medical colleges, a more active psychiatric staff, surveys of patients in general medical and surgical wards, and Dunbar's epoch making survey of the literature published in a book under the title "Emotions and Bodily Changes," each contributed to focusing attention of the medical profession in general and the psychiatrist in particular, on the role of emotional factors in somatic disorders.

The increasing recognition of emotional tensions as predisposing and causative factors in somatic disease as well as in psychological disorders and social and economic maladjustments is one of the important trends in modern medicine. Emotional tensions, too, are often the basic factors in delayed convalescence, resistance to seeking medical attention and uncooperativeness in following through with treatment.

The emotional factors in protracted convalescence are illustrated by the following case:

Male, age 35, cardiovascular decompensation with valvular heart disease and a history of acute rheumatic fever at the age of seven. Under treatment in the hospital he regained a good level of cardiovascular efficiency but he continued to complain of palpitation, shortness of breath, and general weakness. These symptoms were particularly troublesome when his discharge from the hospital was imminent and at this time excessive perspiration, fine tremors, and pupillary dilatation were observed. He had never emancipated himself from his mother and, even as an adult, she bought his clothes for him, watched over all his needs, and made his personal decisions for him. He had never married or shown any interest in girls. His mother had died three months prior to his admission to the hospital. The protective atmosphere of the hospital and the nursing attention gave him the security he had missed since his mother's death. When confronted by the withdrawal of this security, for example, discharge from the hospital, anxiety occurred.

I do not have to quote specific cases to illustrate the part emotional factors play in procrastination or failure to seek medical attention. The untreated case of specific urethritis and the woman who puts off going to the doctor about a carcinoma of the breast are personalities known to all physicians; the former goes untreated because of guilt or shame and the latter because of fear, not fear of surgery, but fear of having her suspicions of cancer substantiated.

Emotional tension is the reaction to psychological or physiological inability to adapt to or escape from noxious intrapersonal or extrapersonal factors, forces and situations. That which is innocuous to one person, may as a result of conditioning, be "noxious" to an-

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other; consequently it is often a matter of personal attitudes or the subject's point of view that is the determining factor in producing emotional tension or anxiety. A case in point is the employee who gives up one job after another because he cannot get along with the boss. As a child he had to contend with an authoritative overly restricting parent for his right to grow up. Thus we find him, as an adult, psychologically allergic to authority in whatever form he meets it.

The aim of psychotherapy is to eliminate destructive emotionalism and cultivative constructive realism in the subject's attitude toward himself, others and life in general. Most emotional tensions come from hating or fearing phantasms, the ghosts of the past or the specters of the future.

Emotional tension is all pervasive, and its effects permeate psychological, social and somatic areas. In its simple and uncomplicated form of expression it appears psychologically as fear, apprehension, guilt, mental uneasiness, uncertainty, indecision, insecurity, feelings of inferiority, desire, disgust, aversion, antagonism, resentment, hostility, hatred, etc.; physiologically, as tachycardia, dyspnea, vertigo, syncope, flushing, pallor, sweating, salivation, nausea, vomiting, disturbances in gastro-intestinal motility and secretion, urinary frequency, muscular weakness, tremors, etc. In its chronic forms it appears as neuroses, personality and social maladjustments, psychosomatic disorders, and some of the psychoses.

Contrary to popular medical belief the absence or denial of conscious, subjective anxiety (nervousness) does not indicate, in itself, that the subject is free from emotional tensions; a case in point is as follows:

Male, age 45, married, peptic ulcer of eight months duration, friendly, affable, talkative, "not a worry in the world," he says. During the personality interview he lost his composure, wept, and became emotionally disturbed as he related his motherless, lonely, insecure childhood, his hopes for warmth, affection and children in marriage, and his bitter resentment and feeling of hopelessness in finding himself married to a selfish, austere, cold, domineering, demanding, frigid, sterile wife. His adaptation, for him a diluted compromise, is a 12 to 14 hour day at the office, golf, night clubs, hunting and fishing expeditions "with the boys," substantial midnight suppers and plenty of cocktails and highballs to boot. These adaptations, unsatisfactory as they may be in themselves, protect him from intolerable conscious anxiety; as he puts it, "I would go crazy thinking about what, on the one hand, I want so much from life and, on the other, what I don't have."

The absence of subjective conscious anxiety in the presence of emotional tension is the work of a psychological phenomenon known as repression. Repression is an automatic or autonomous function of the mind by which the painful and mentally disorganizing effect of anxiety or emotional tension is blocked off from consciousness in the same manner as sensory stimuli are blocked off from consciousness in the hysteric. Perhaps repression is best understood as the psychological representation of the tendency in all biology for the living organism to move in the direction away from that which is destructive to it. Thus, through repression, a relative freedom from the immediate effects of the mental discomfort of subjective or conscious anxiety is obtained. However, the emotional tension persists with all its dynamic potentialities for insidious or cataclysmic disorganization, and the result is a distortion in psychological functions, personal relationships or personal efficiency or a repercussion through the thalamus, hypothalamus and autonomic system with consequent visceral dysfunctions. The physician will recognize the similarity of emotional tension without conscious representation to focal infection without pain. The work of repression is illustrated by a patient who was referred to me for hysterical blindness. She had been assaulted with intent of rape. The only memory of the incident was a visual one and consisted of seeing the face of her assailant, but she said it looked like someone she had known somewhere in the past; as she described this memory she covered her eyes with her hands. This had been the fourth time she had been unsuccessfully assaulted; the details surrounding each of these experiences clearly showed that she repeatedly found herself out alone in the late hours of night on unfrequented streets. She was a young woman in her late twenties, but had never been interested in men of her own age; at a distance, so to speak, she admired and secretly felt attracted to a man 20 years her senior. Under sodium amytal narcosis she related in considerable detail a series of sexual experiences at the age of 12 with a male adult boarder in the home. These were associated with a considerable element of guilty pleasure and a vivid recollection of what she called his repulsive face.

Repression, in this case, undoubtedly saved this girl from a deep unbearable sense of guilt. We see, however, how the underlying guilt continued to play its part in her life as she had no normal relationships with men thus protecting herself from any risk of sexual intimacies. At the same time, her sexual drives were not completely denied as she was in love, at a distance so to speak, with a man older than herself. Her psychologically induced blindness served to reinforce her repressive mechanism and its value was not to forget the face of her most recent attacker but to safeguard the remembering of her original attacker.

The susceptibility to emotional tensions and the capacity for dealing with them when they arise are dependent on how the subject thinks and feels about himself, about specific persons and people in general and about his life present, past and future. How he thinks and feels, his susceptibility to emotional tension and how he handles emotional tensions is determined by the interplay of his biological needs or instincts, his functional and structural constitutional inheritance, his family tradition and personalities, the social order, and how his life experiences have weakened, strengthened, conditioned and sensitized him.

A study of the personality in a given case will reveal evidences of emotional tensions, their causes, and how they are reacted to even though conscious anxiety is denied or not in evidence. The findings of the personality study in conjunction with other medical information may then be used to determine the seriousness and significance of emotional tensions in the case at hand.

Psychiatry was the first of the disciplines of medical practice to emphasize that man is a unified organism who behaves and reacts in toto, and that he cannot be understood when he is studied apart from his environment. The entire structure of all psycho-pathology rests on the psycho-biological principle which regards man as a biological organism with the same identical survival needs common to all forms of life, with a highly evolved and complex nervous system, and living and functioning in a complicated social structure. By reason of his kind of nervous system, he has a concept of himself as a personality as something more than a collection of skin, bones, muscle and viscera. The same fundamental biological laws apply whether it is his body or himself as a personality that is to be preserved and protected. As a result, one sees in every-

day life as well as in psycho-pathology, evidences of evasion, defense and compensation in an effort to preserve, protect and defend the integrity of man's concept of himself as a personality.

I have recently seen a boy, a minister's son, who had been arrested for robbery. As the story of his life was unravelled, this fair-complected lad with light wavy hair and of a rather feminine build told how his physique and general appearance, his mother's admonition that he set a good example for the neighborhood children all led, not only to the other boys calling him a "sissy," but also an increasing conviction of his own that he was a "sissy." His comment about the robbery was "Well, sissies don't commit robberies." Thus, by commiting the robbery he recovered his own self respect, but at what an expense.

WHAT is the place of psychiatry in industry? Is there a need for it in industry? Personally I know nothing about the problems of industry except what I read in the papers and what my colleagues relate to me. I do know that industry in the final analysis is comprised of a group of people trying to do something about something. As a psychiatrist, I know the biggest job of any human being is to adapt himself to other human beings and to authority, whether it is the authority of someone else, the authority of the social order or the group, the authority inherent in the job itself, or the authority he has over others. Psychiatry has much that is basic to offer in the whole area of group relationships as well as a technic for identifying and aiding the insecure and conflicted worker and executive.

As a psychiatrist, I know that work efficiency inevitably suffers when a psychological difficulty prevails; both management and labor individually and collectively must of necessity be interested in efficiency as it is reflected in the quantity and quality of output and the amount of money in the pay envelope.

Within the confines of the medical department of any industrial organization, the same people are seen and treated as are seen in any doctor's office, hospital or clinic. Other things being equal, how does it happen that some workers are accident prone? Why do some workers have an unduly prolonged convalescence from illness or injury? What about all those workers who suffer from physical symptoms in the absence of any demonstrable organic pathology? Persons with accident proneness, delayed convalescence and functional disorders are familiar figures in a psychiatric practice, and many are cured or materially improved when properly and adequately dealt with and treated.

So far as the place of psychiatry in the medical school curriculum is concerned, the present need in medical education today is to train the student to understand and recognize the emotional and environmental factors that often lead to ill health, both physical and mental, personal inefficiency and interpersonal conflicts. In presenting psychiatry to the medical student, the subject matter should be continually oriented to the general practice of medicine rather than to the practice of psychiatry as a specialty. Naturally, doctors should know sufficient about the major psychoses in order to make a proper diagnosis and see to it that such patients are given the proper attention and care. However, the personal reactions and mental attitudes of sick people and the bodily responses to emotional disturbances are matters of extreme importance in the everyday practice of medicine. Emphasis should therefore be placed, in psychiatric instruction, on presenting psychiatry as a basic science rather than within the limited framework of a medical specialty.

The medical student needs instruction in the recognition of psychological problems long before these progress to fully developed psychiatric disorders. The general practitioner is on the front line of defense when it comes to mental hygiene, and he should be sensitized to his responsibility in this area of public health during his medical school years.

Stuart Chase, in his book entitled "The Tyranny of Words," says, "The chief business of man is to come to grips with his environment, to reproduce his own kind and to live as long and as comfortably as possible." The factors which deny to man the fulfillment of his life objectives are physical, mental and environmental each inter-related with the other.

The chief business of the physician is to understand, prevent, cure or ameliorate man's total or partial failures in life.

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Abdominal Wounds and Injuries

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IN WAR as well as in peace abdominal injuries furnish some of the most important if not the most common problems that surgeons interested in trauma are called upon to solve. An accurate diagnosis is often difficult. The details of surgical therapy require unusual competence on the part of the surgeon, the risk is at best always grave and the cost of error is disaster. There are naturally in war a greater number of wounds caused by bullets and fragments of metal than occur in civilian accidents. However, such wounds, and injuries due to falls and crushes, do not differ essentially as regards the lesions produced, or the details of treatment, whether incurred in war or in peace. There are two important differences imposed by battle conditions which deserve emphasis. First is the fact that the need for evacuation of casualties may affect the selection of the time and place where treatment is to be furnished. Secondly, the need to transport casualties to the rear as soon as their condition will permit—unfortunately sometimes sooner—is a factor affecting the welfare of the man in general and his wound in particular. It makes but little difference whether a man is jolted in an ambulance or jeep over rough roads, is carried for several hours by natives through the jungles, or even is carried by plane; such transportation causes fatigue. The jolting and moving cause a shift in tissue planes which induces further cellular damage and hemorrhage, resulting in pain and more shock. In our civilian hospitals any patient with a serious surgical illness or injury is admitted, is treated by the surgeon and is kept in that same hospital under the same surgeon until he is ready for discharge. In combat the decision must be made as to the safety of transportation to a hospital in the rear with fuller facilities of personnel and equipment. After operation transportation to the rear will be necessary at the earliest moment consistent with safety, or perhaps sooner if the installation must move forward. The patient with a head wound differs

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in his ability to withstand the rigors of transportation from him with an abdominal or thoracic wound or compound fracture. The head case stands transportation far better before than after operation, a point which makes feasible the establishment of head centers at some distance from the front line where these patients can receive specialist care and be held as long as necessary. With few exceptions, including those flying personnel who succeed in returning to their base after being wounded on missions, all those with thoracic, abdominal or severe extremity wounds incurred in combat, will require treatment at the front. This urgent need was answered by bringing highly trained surgeons up to the wounded rather than bringing the wounded far back to the surgeons. The graduate and post-graduate medical education during the years since the last war has given unequivocal evidence of its worth by the large number of highly qualified surgeons that have been available and have produced such superb results on surgical teams under most primitive conditions in all theaters close to the front. Even in the New Guinea jungle during the Buna campaign, back in December, 1942, and early 1943, some abdominal wounds were cared for within an hour of being incurred. Such speed in finding and bringing in the wounded was, to be sure, unusual, but the reduction in mortality in combat casualties in this war is principally due to the fact that first class specialist care was furnished to the seriously wounded by highly trained surgeons at the earliest possible moment. These men have all the modern methods, substances, and drugs at their disposal but the *sine qua non* of successful surgical treatment is that it be based on sound principles and carried out by highly trained men. The interest and enthusiasm over the bacteriostatic substances, and the brilliant results from their use, have tended to obscure the fact that these drugs and substances, important as they may be in helping to prevent severe invasive infection, are merely adjuvants to and not substitutes for adequate surgery.

IN TRAUMATIC surgery wound healing, the repair process, is the heart and substance of therapy after the dramatic element of prevention of death from shock has been achieved. When shock has been overcome efforts are directed to repair of damage as the first step, and secondly so to arrange the wound that the repair process may proceed unhampered. The one main adversary is infection. In military surgery efforts are directed in the forward area to the treatment of shock and hemorrhage, psychic strain, and the local results of trauma, to prevention of infection and preparation for evacuation to the rear, or return to duty; whereas at the base, or in the zone of the interior, control of infection, reparative and reconstructive procedures, convalescence and rehabilitation compose the therapeutic pattern. In both areas in military hospitals, and in the emergency wards, operating rooms and wards of civilian hospitals, the threat of infection to life, limb and function is ever present. A large majority of any imperfect results of treatment are due to a neglect of this threat, or a compromise for the sake of some supposed advantage. It is certain that the postwar treatment of compound fractures for example, will include many of the measures developed during the war that are now standard practice in the Armed Forces and are giving such excellent results. Small arms, shells, bombs, and accidents involving airplanes and the many types of military motor vehicles cause abdominal injuries of all varieties in numbers far above the incidence of civil life. Experience has, to a degree, crystallized opinion on the value of certain techniques and has re-emphasized the truth of many principles. The importance of shock and internal hemorrhage, the degree of aid given by the x-ray, the care of the soft part wound, the importance of drainage of the intestinal contents in wounds of the colon, and what can be accomplished through the thoracic wound in thoraco-abdominal injuries, are some of the points that have gained in clarification. The difficult diagnosis in cases where there is doubt as to intra-abdominal damage is still as difficult as it always has been and will probably continue so.

Immediate death following injury is due to overwhelming shock or the sudden interruption of essential organic function. Deaths occurring shortly after injury are in the main due to shock or massive bleeding, a distinction without an important difference therapeutically. Death occurring after the lapse of several days is caused by complications, the most common of which is infection. Death is preventable if the results of shock and hemorrhage can be forestalled or overcome, if infection, secondary hemorrhage and other complications can be prevented, and if interrupted physiological function can be restored. These are the objectives of treatment. The details of how they may be achieved will vary.

The medical literature of the past few years is so rich in articles on the treatment of shock that there is no need to do more than mention certain points of particular interest. Severe shock in abdominal injuries is rare in the absence of hemorrhage. Abdominal wounds involving the intestinal tract when associated with vascular damage and severe hemorrhage are famous for their high mortality rate, even with early operation, largely due to the increased shock from the loss of blood. Plasma, although excellent for treating the early hemoconcentration in the shock from burns, is merely a stop gap in the treatment of severe shock following abdominal trauma. Blood is needed to replace blood loss and to offset the ensuing anoxia. A start toward the restoration of normal values in the circulating blood can be made by the use of plasma if blood is not immediately available, but in these cases hemoconcentration is only part of the abnormality, and secondary in importance to the loss in blood volume and red cells. Treatment of shock should receive priority over extensive physical examination and the taking of x-rays in serious cases.

It is the strong opinion of observers in the different theaters of operation that the mental attitude is wrong which assumes that because the patient is in desperate straits an immediate operation is indicated regardless of the state of shock that may be present. Time taken to treat shock prior to operation even in the desperate cases pays dividends in a reduced mortality. Such a patient needs large amounts of blood and he needs it at once. These patients as well as those of less gravity are the men for whom the blood bank is life saving, for whom the blood being flown across the Atlantic and the Pacific means that, at times, subtle difference between death and life.

Many photographs have been published showing battle casualties receiving plasma or blood while being transported under great danger and difficulty. It is therefore obvious that a patient in a civilian hospital can be moved to the x-ray or operating room with blood flowing into his veins. In most cases blood should be given before, during, and after operation in the amounts required. An excess should be avoided, but this error is far less common than the reverse as usually large amounts are called for. If the supply is limited, care should be taken to insure that blood is being given at the moment that the peritoneum is

opened and for some time subsequently. This stage in the operation is the time when a sudden fatal change in condition may occur, and is particularly important when there has been a copious hemorrhage as with rupture of the liver or spleen. For many days following operation, well into the convalescent period, attention must be paid to the possibility that blood volume and quality are deficient, and be corrected accordingly.

It is often difficult, but of paramount importance, to be certain as to the presence of intra-abdominal hemorrhage in such cases as suspected liver and spleen injuries in which otherwise operation would not be indicated. In many of these cases bleeding is temporarily controlled, but the block gives way later with suddenness and rapidly ensuing fatality. Needle puncture has been recommended as a diagnostic procedure in this group, but this method carries definite risks and too high a factor of unreliability. An almost certain method to clear up doubt is by an incision under local anesthesia down to the peritoneum. Free blood, if present, can usually be seen through the intact peritoneum. If doubt persists a small opening may be made in the peritoneum for deep exploration with a culture swab. Such a wound can be readily closed, or used as part of the wound for formal exploration if this is indicated. The most important problem in differential diagnosis occurs in fracture of transverse processes of lumbar vertebrae which give the classical physical signs and many of the symptoms of intra-abdominal hemorrhage. An example of this was furnished by a member of the crew of a bomber that made a forced landing in the sea several miles off Port Moresby. He was brought into a hospital 14 hours later with a rigid tender abdomen, a slightly lowered blood pressure, but normal pulse, temperature and blood count. The question was raised whether abdominal exploration was indicated, but x-ray examination revealed the fracture of several lumbar transverse processes. In his case, at that interval following injury, the diagnosis that there had been no intra-abdominal hemorrhage seemed to be proper and was proved to be correct. Had he been seen shortly after the accident, despite the x-ray evidence, there might have been enough doubt as to the presence of hemorrhage to have warranted the small incision just mentioned.

The great frequency of wounds from missiles of various types in military practice makes examination by x-ray more frequently important than in civilian life. With perforating wounds the path of the missile is obvious and one knows that there is no retained foreign body. With penetrating wounds so much information can be gained by use of the x-ray that this examination is obligatory. The shape, size, and speed of the missile determines the degree of injury caused to bone and soft parts. Bullets are usually travelling at high velocity and may pass through tissues causing only limited damage; however, they may cause extensive comminution on striking a large bone, are sometimes readily deflected, and only seldom carry clothing with them into the depths. Shell fragments are irregular, cause much laceration of tissue, and frequently carry with them clothing and other foreign material. Pieces of clothing and equipment, gross dirt, and vegetable matter, such as wood, leaves and grass are far more important as agents for the production of infection than are pieces of metal. The site of the foreign body and the path that it has followed must be determined, as they may affect markedly the operative procedure to be adopted. This is particularly true when the missile may have traversed the diaphragm from the thorax into the abdomen, and vice versa, or the posterior wall of right or left colon, the rectum or the base of the bladder. Visceral damage in the latter areas easily escapes notice in an abdominal exploration done under adverse conditions and if not properly attended to may be followed by serious complications.

THE treatment of chest wounds, a whole subject in itself, has been advanced to a marked degree by surgeons in the various theaters of operation. In line with this discussion is the thoraco-abdominal wound which presents a most serious problem particularly, when the chest wound is large, or of the sucking variety. Reports from American and British sources indicate that in those cases that require operative attention to the chest, if the damage in both cavities can be attended to through the thoracotomy wound there is a lower mortality than when a laparotomy is also done. Obviously a laparotomy will be required if the missile has passed from the chest to the pelvis, or one of the lower quadrants, and vice versa. However, extensive repair can be furnished through the diaphragm to injuries limited to the upper quadrants. On the right side lacerations of the liver may be sutured or packed with fibrin foam or cellulose. On the left side the sub-diaphragmatic viscera are particularly convenient to attention from above. Splenectomy and repair of injuries to the fundus of the stomach are easier through a thoracotomy than through an abdominal incision as these structures and the splenic flexure will usually be extruded through a wide opening in the diaphragm. The splenic flexure is hard to reach from below and requires careful inspection when the spleen has been wounded.

Given a sucking wound of the left chest with rib fracture and suspected damage limited to the left upper quadrant, the operative procedure, after measures to combat shock have been instituted, would be in general as follows. Under intra-tracheal anesthesia the chest wall is debrided as conservatively as possible, the ribs are spread, the phrenic nerve is crushed and the opening in the diaphragm enlarged. The left upper quadrant can then be completely explored and any injuries dealt with. Repair of the diaphragm, expansion of the lung and closure of the chest wall are then accomplished preferably without thoracic drainage. If the splenic flexure has required suture this area should be drained subcostally and a proximal colostomy without abdominal exploration should be done over a rod through a small incision. A procedure such as the one described would be equally applicable in civil life under similar circumstances but, it is again emphasized, is indicated solely when it is certain that the path of the missile has involved the chest and only the upper quadrants. When the lower abdomen has been traversed one cannot escape exploration through a separate abdominal incision.

Proximal colostomy was just mentioned in connection with the hypothetical splenic flexure wound repaired via the diaphragm. The urgent importance of drainage and decompression of the wounded colon has been amply demonstrated. The stomach and small intestine hold sutures well and may be readily decompressed by an in-dwelling tube, but the thin walled colon is less tough and shows a tendency to leak under the slightest provocation of distension. The disastrous results of such leakage prompted the formulation of the ideal methods of dealing with wounds of the colon and rectum, whether such wounds be single or multiple and whether situated in one of the fixed or readily mobilized portions. The wounded small intestine should be re-established by suture and never be drained openly

or exteriorized, whereas the wounded colon should always be treated with a free open colostomy. The colostomy will include the wounded portion when the wound is a single one, is in one of the readily mobilized portions, or is so large as to make reconstruction difficult. Ordinarily it is better to repair a small wound at the hepatic or splenic flexure to avoid exposing a wide area of retroperitoneal tissue, as is inevitable if one exteriorizes these areas, and then to make a proximal colostomy to relieve the suture line of stress from any subsequent distension. Resection and anastomosis of the wounded colon is contra-indicated even with colostomy, as such an anastomosis is time consuming and at best precarious because of contamination to retroperitoneal tissue and likelihood of impairment of circulation. Instead of attempting anastomosis it is preferable to bring both ends of the colon to the surface. With multiple perforations the ideal procedure is to make the colostomy include the proximal opening and to close the others by suture. Whether the colostomy is the simplest form over a rod or is a neat double-barrel affair with approximation of the two limbs by suture is not of great importance. What is important is that as little intra-abdominal manipulation be done as possible, that there be no tension and that the opening be wide and free. Leakage, impairment of circulation and tension from distension are still the important post operative dangers in large bowel surgery.

Penetrating wounds of the buttock often seem to be minor affairs but many of them lead to serious intra-abdominal damage. A large number of the rifle bullet wounds of the buttocks resulted from snipers shooting from the rear at a crawling soldier. The crawling position involves an approach to the knee-chest position, therefore the path of a bullet striking the buttock may be on a line leading into the abdomen, the pathway being available for a fragment from a shell exploding behind a man. The depth to which the missile has penetrated, and its track, will determine whether injury is done to one or more of the following structures: rectum, sigmoid, lower ileum, bladder, hip joint, and bony pelvis. It is, therefore obvious how important radiographic evidence will be in these wounds, as the position of the foreign body may be the deciding factor in the indications for or against laparotomy.

In military experience, suprapubic cystostomy following repair of bladder wounds has been found to be far superior to perineal or uretheral drainage because of the exigencies of transportation. Emphasis has been placed in directives on the importance of placing the tube high in the bladder to avoid kinking of the tube or pressure on either the symphysis or the trigone.

The wound of the rectum, either by a missile or by inflation, as occasionally occurs in civil life, carries a threat to life from local and spreading infection, and promises a long drawn out period of healing. Open treatment of the wound of the soft parts and diversion of the fecal stream are the two fundamental principles to be observed in these cases. The wound of entrance must be debrided with great care and left open after repair by suture of the rectal wall. Drainage of the sacral fossa must be provided. It has been suggested that this is provided best by removal of the coccyx to allow insertion of the drain in the mid-line, but it is now recommended that the drain be placed lateral to the coccyx to avoid osteitis of the sacrum. This is not as simply done as the former method but is efficient, is less unpleasant to the patient, and heals more readily. An efficient colostomy that will function perfectly for many weeks is indicated in every wound of the rectum or where the blood supply has been impaired to such a degree that necrosis may occur. This is a life saving measure in the early stages and later is a factor of prime importance in wound healing The colostomy should have the stomas separated by a strip of skin to prevent the passage of feces from the proximal loop into the distal one underneath the dressings. The somewhat greater nuisance of closing this type of colostomy is more than offset by its greater efficiency.

Local and invasive pyogenic and anaerobic infection are not uncommon following wounds into the colon, particularly when the buttock is involved. Osteomyelitis of the sacrum or ilium occurs frequently when these bones are damaged and is a particularly annoying complication. Accurate debridement of the soft part wound with removal of dead and devitalized tissue, unattached fragments of bone and readily obtainable foreign bodies, is of vital importance. The sound principle of leaving wounds open must be adhered to if possible. This can be partially followed in the abdominal wound by not approximating skin and subcutaneous tissue, although peritoneum and aponeurosis should be sutured. Local chemotherapy is far inferior to the systemic use of the sulfonamides and penicillin, by many is held to be useless, and by some definitely harmful. Penicillin should be started at the time of operation and continued in large doses until the danger of infection is past.

IT IS OBVIOUS that this discussion has dealt with only a few of the methods found to be satisfactory in military experience in the care of wounds and injuries to the abdomen that may be equally useful in civil practice. Details of technique and other minutiae which are of common knowledge or readily available in the literature have been avoided. There has been in the surgery of this war a healthy re-emphasis on the basic principles of wound healing, on the treatment of shock, and on the importance of functional re-education. It has been not so much any particular method *per se* that has received attention in the various theaters of operation as which method aids the tissues themselves most in the process of wound repair. The cells and tissue fluids will contribute toward the healing of any wound, regardless of the organs and tissues involved or the super-imposition of infection, the same elements and processes used in the repair of a simple incised wound through skin and subcutaneous tissue. In traumatic surgery, whenever a wound has been inflicted, one is dealing with a contaminated wound. The surgeon at the first operation should strive to change a contused lacerated contaminated wound that may harbor foreign bodies into as nearly as possible a clean incised wound with walls of healthy viable tissue and containing minimal contamination. Measures should be taken to avoid further contamination and to prevent the development of infection. Neglect of the factors involved in wound healing and violation of the fundamental principles of surgical technique, whether through ignorance, carelessness or conceit, never fail to threaten the smooth healing of wounds. Fortunately, the repair process has a marvelous *vis a tergo* that succeeds in spite of many handicaps, and will be encouraged if the surgeon bases his procedures on fundamentals using modern bacteriostatic agents as adjuvants to and not as substitutes for proper surgery.

Discussion

DR. FREDERICK W. SLOBE (Chicago): I am sure there is very little that I could add to COLONEL PARSONS' very complete discussion. However, since this is an industrial meeting, I shall confine my remarks to the industrial viewpoint; and, since this subject is so broad, I shall

further limit my remarks to one of the most dramatic of abdominal injuries, namely, the so-called "closed" abdominal trauma.

Fortunately, severe abdominal injuries are quite rare in industry, and of all accidental deaths occurring in civil life, only about 1% are due to abdominal injuries and, of the abdominal traumatisms which do occur in industry, the majority are mild without causing any visceral damage.

Closed abdominal injuries may be subdivided into four groups from the standpoint of establishing an operative indication. First, there is the obviously very serious and, perhaps, hopeless, type; obviously, the diagnosis of an intra-abdominal injury in such instances is easily made. In the second group, the diagnosis of intra-abdominal injury is also quite obvious and the operative indication is definite. In the third group, the operative indication is much more uncertain, and the diagnosis of an intra-abdominal injury requiring operative exploration is in doubt. The fourth type is the mild type in which observation after a few days indicates that no operative indication exists.

The most important of these groups is the third group because it is here that careful observation and study determine whether an operation should be performed. As students, we were all given the dictum relative to closed abdominal injuries, "When in doubt, operate." This is excellent from the standpoint of didactics, but in actual experience, we know it is not true. We know it is advisable to hospitalize every instance of closed abdominal injury of any appreciable degree for study and observation. Unless we were in doubt, we would not send these patients to the hospital. The majority of these patients do not require operation, hence disprove the dictum which I have just quoted. One stands ready to operate immediately when the indication exists, remembering that it is better to perform many early laparotomies and find them all negative than it is to let one patient go until peritonitis develops and operate too late.

There are some old rules which we all know about, and they are always worthy of re-emphasis, such as: rest in bed; no opiates; frequent observation of the pulse, temperature and blood pressure; frequent blood counts, hemoglobin and hematocrit determinations; scout x-ray films; repeated observation as to tenderness and rigidity. One must remain in attendance to watch the progress, as time is of the essence, the mortality being higher each hour of delay (assuming appropriate measures have been taken to control shock), so that operation after four or five hours may be too late.

An important diagnostic point is the character and type of pain. The patient who has a visceral perforation from a closed injury will usually complain of severe, quite constant pain. It is usually so severe that he insists on something being done and is usually grateful when he is taken to the operating room because he recognizes the need for drastic action. If the perforation remains open, this pain usually increases and becomes more constant. Very important, also, are tenderness and rigidity, the latter soon becoming board-like. The history of the injury is of considerable value in estimating the likelihood of intra-abdominal trauma. Blood examinations help in interpreting the degree of shock and hemorrhage, but are frequently misleading. To wait for leucocytosis and distention to develop before operating means waiting until peritonitis has set in with a very high mortality ensuing.

One must always bear in mind the diffuse rigidity which may occur following injuries to the back and of the ribs, but tenderness is usually much less marked in such cases. Also, distention coming on in an hour or two, is likely to be of the reflex type.

It is well to recall that some individuals with very serious intra-abdominal injuries may walk around evidencing relatively little shock. I would like to report concerning a patient whom we have in the hospital now and who suffered quite an unusual injury. Eight days ago, at 8:15 A.M., this patient, a man of 45, was sharpening a file on a grinding wheel. The file stuck in the wheel in some way and the end of the wooden handle struck the patient in the epigastrium, the man's hand remaining on the file meanwhile. He experienced very little immediate pain and there was no injury to the skin except a very slight bruising. He walked two blocks to the plant first-aid department and, during this period, he felt chilly and somewhat weak. After arriving at the medical department, he vomited. The vomitus was not blood-stained. Gradually, pain developed which became more and more severe and constant, but it was not until three hours later that he was taken to our office in a car and first seen by us and immediately sent to the hospital. When we first saw him in the hospital, he complained of excruciating pain which was much worse when he was lying flat on his back, so he insisted upon sitting up in bed. In addition to diffuse abdominal pain, pain radiated to the left side of his chest and his left shoulder. The abdomen was retracted and there was board-like rigidity. Diffuse tenderness was present, most marked on the left side in the left upper abdominal quadrant. Blood examination showed nothing significent. The blood pressure was 122/80.

A diagnosis of probable rupture of the ileum was made. He was given blood plasma intravenously and prepared for operation. His pulse rate was 92 and of good quality. Upon opening the abdomen, liquid blood and blood clots were seen, and upon exploring the upper abdomen, stomach contents gushed forth. Considerable bleeding also occurred which was difficult to control. A complete severance of the first portion of the duodenum was found, with the omental attachments stripped away from the duodenum and stomach. The duodenal stub was lying posteriorly, covered with clotted blood, and there was a wide separation between the proximal and distal ends. The site of severance was quite ragged. Meanwhile, citrated blood was being administered, a total of one quart being given during the time the patient was in the operating room. The blood pressure dropped to 70 during the operation, and, because of his condition, it was deemed advisable to perform the repair which was most rapid, namely, an end-to-end anastomosis. Considerable bleeding occurred which was difficult to control. A tube was passed into the stomach through the nose for continuous postoperative suction drainage and the abdomen was closed without drainage. He was kept on intravenous solutions exclusively for seven days. He was given 20,000 units of penicillin intra-muscularly every three hours. Moderate distention developed and, for the first week, his temperature averaged between 101 and 102°. His pulse averaged between 80 and 90 and remained of good quality. A partial wound disruption occurred on the fourth day with a partial evisceration which required a second visit to the operating room to close the abdomen. Blood-stained fluid was present in the abdomen. The site of anastomosis was not inspected. The stomach tube was withdrawn in seven days and he was put on liquid feedings by mouth. No vomiting has occurred, the distention is relatively slight, and he is passing stools. His temperature on the eighth post-operative day was 99.8 and his pulse was 80. Although he is not out of danger, we feel quite encouraged at this time.

This type of injury is quite rare and always quite serious. A rupture of the duodenum causes a higher mortality than a rupture of any other part of the small intestine or stomach. Retro-peritoneal rupture of the duodenum occurs occasionally, about 36 cases having been reported, and, of these, there has been a 50% mortality. Complete traumatic division of the duodenum, of course, is very much more rare.

Visualizing the mechanism of this injury, it was probably caused by direct pressure of the end of the file crushing the duodenum against the projecting spinal column. It is well to bear in mind that a circumscribed blow such as this one is more likely to perforate the stomach or intestine, whereas a diffuse blow is more likely to injure the liver, spleen or bladder.

DR. E. C. HOLMBLAD (Chicago): I haven't been as fortunate as DR. SLOBE, to have just that type of opportune stomach case come in for reporting or for consideration, but I do want to take this opportunity to thank COLONEL PARSONS for a very instructive discussion of this subject.

DR. SLOBE took up the closed abdominal wound, and I would like to discuss a phase of this abdominal differential diagnosis that I have had occasion to see. It has been a puzzler with me at various times, and I am sure that you men who see these traumatic injuries have the same type of problem facing you.

In industry, unfortunately, we see multiple injuries. In other words, I think one of the things we try to teach in traumatic work and industrial work is the fact that patients have a type of injury which may be multiple in character.

One of the things we have constantly to stress and drive home is that the patient who falls down an elevator shaft may have not only a skull fracture but also fractured heels and other injuries. So we try to teach constantly to be on the lookout for associated pathology. One of the things that has given us trouble is the differential diagnosis of the acute distended abdomen in individuals who have had various types of falls or injuries. The elevator shaft accident is one of those. The fellow who is run over by a railroad train or who is thrown from a train, as well as other types of injuries, offers the same situation.

I would like to call to your attention the problem of differential diagnosis of the acute distended abdomen or tender abdomen that is associated with spine pathology or, as COLONEL PARSONS mentioned, the retroperitoneal hemorrhage, the transverse process hemorrhage. We see quite a few cases of retroperitoneal hemorrhage from direct blows on the back. We see quite a few fractured spines, particularly the lower dorsal, upper lumbar vertebra. We had one such a few months ago, that we saw on a Sunday morning, in which it was very difficult to arrive at a positive diagnosis as to whether this man did or did not have an intra-abdominal viscus injury. He had extensive head injuries; both eyes were closed with extensive subconjunctival hemorrhages so indicative of skull injuries as a rule; extensive hemorrhages in the chest wall; an obvious injury of his back; and within, I would say, half an hour after his injury his abdomen was distended and acutely tender.

I think the orthopedic surgeons will agree that the problem of acute abdominal distention is a difficult one, to rule out abdominal injuries if you have had an adequate trauma. DR. T. L. HANSEN, of the Rock Island Lines, happened to be in the hospital; DR. JACOBSON saw him; we also had two or three other men see him that morning. After going over the case, we came to the conclusion that we should not open up this abdomen; that it was a reflex abdominal distention; that it did not require surgery; and that the man had a better chance of living if we didn't open him up. So he was treated conservatively and made a very nice recovery with his compression fracture of the first lumbar vertebra, in addition to his other injuries.

The automobile accidents that occur on the highway are very frequently associated with retroperitoneal hemorrhages, and particularly perirenal hemorrhages. I think that type of injury is associated with abdominal distention. So far we have been fortunate in being able to make fairly good decisions on whether we should or should not open these abdomens, but one of these days we are going to be disappointed because such things will come along that will fool us.

We did have a problem about a year ago that was instructive. I mention it to you because it shows how you have to be on your toes all the time. This man, about 70 or 75 years of age, was walking along the street. He was quite feeble. He had a lot of arthritis in his knees. He wobbled quite a little, and stumbled and fell. We had had him previously, so we knew that he had a very definite gastric ulcer history and had a very definite peptic ulcer. The picture was that of a gastric hemorrhage, or possibly a hemorrhage from this pyloric ulcer. Because of his age and because of the history, knowing about this ulcer, we chose to treat him conservatively. He went along quite well for several days, then all of a sudden out of a perfectly clear sky he died. We were very much amazed at the autopsy to see that this man had rather extensive tears in his liver which had come simply from his having fallen from a standing position to the curbing. I learned distinctly from that experience. I don't think he would have been with us today, even if we had operated on him, because of the various other factors, but the point is, you can't always be too sure of yourself.

I was certainly pleased to hear COLONEL PARSONS mention the fact of this differential diagnostic problem occasioned by retroperitoneal hemorrhages, and also this question of sympathetic or reflex distention. It is, to me, a very difficult diagnostic problem.

DR. J. DANIEL WILLEMS: The Colonel gave us so much to listen to that if he did speak about this I would like to have him reiterate. We hear much in these societies the past few years about the value of x-ray for the localization of air underneath the diaphragm as a valuable aid to diagnosis. I would like to hear the Colonel express himself on that.

DR. ROLAND A. JACOBSON: The Colonel dwelt on this point to some extent, but I would like to have a little more information on the use of sulfonamides locally. When the war first started and the casualty rate was high and we heard what excellent results the Service was getting, a lot of it was attributed to the fact that they were using sulfonamides locally and extensively in intra-abdominal wounds as well as compound fractures. In recent years, as the Colonel indicated, the scientific work has come out that the sulfonamides locally are probably of little, if any, use in wounds. There is even some question if they don't inhibit healing and have other effects of that type. I am wondering whether the practice in actual combat areas has changed any as to the use of sulfonamides, particularly in intra-abdominal wounds.

DR. THOMAS C. BROWNING: I would like to ask about the management of contused bowels, especially those contusions which involve the mesentery and which at time of immediate operation might look very innocent but at postmortem would show extensive thrombosis and gangrene of the bowel. I believe that most of those cases are seen, not at time of immediate surgery because they are not discovered, but postmortem. Where there has been a contusion of the mesentery which led to thrombosis and gangrene, would immediate management of a case of that type be helpful; and if so, how could it be discovered, and what would the operation be?

COLONEL PARSONS: I certainly think DR. SLOBE is to be congratulated on that very interesting duodenal injury and the results that he has obtained in it. Of course the same thing can happen to the ileum lying across the vertebral column, but the ileum is far easier to handle than the duodenum. In war the multiple injury does occur, as DR. HOLMBLAD mentioned in civilian accidents, and that is one of the things that the surgeon in the forward units must be constantly on the lookout for. That applies to everything—head, chest, abdomen, extremities. The natural interest in one major wound must not absorb all one's attention. Complete examination of an extremity is particularly important in relation to circulation, distal to the point of injury, and any associated nerve injury.

DR. WILLEMS asked about the question of x-ray evidence of air under the diaphragm to indicate damage to a hollow viscus. When it is present, it is certainly helpful. The absence of air under the diaphragm, in my opinion, should never be taken as proof positive that there has not been an injury to one of the hollow viscera because changes in position of the individual, position of the individual at the time he was wounded, amount of extravasated fluid in relation to the air, the question of adhesions, and a typical attachment of peritoneal reflections, may prevent the bubble of air getting up into the subdiaphragmatic position. I have a feeling that all abdominal injuries should pass through the x-ray room on the way to the operating room. Even with fractures of vertebra, transverse processes, or ribs, and with evidence by x-ray of loss of the solar shadows, so that you are pretty sure there is a large retroperitoneal hematoma, you often cannot be sure that there is an associated intra-abdominal injury too.

Everybody agrees that those cases are hard as diagnostic problems and I imagine the next generation and maybe a generation or so after that will find them just as difficult as we and our predecessors have found them.

The local use of sulfonamides is a long story, DR. JACOBSON. There is no question but that the golden medical discovery was trusted in too implicitly early in the war. Many enthusiastic articles appeared all over the world that were perhaps lacking in proper critical discrimination and gave too little credit to good surgery. There were many instances where implicit confidence in the local use of the sulfonamides without proper surgical care for the soft part wound produced bad results.

One of our units, which produced a series of superior results in a large number of cases in the Admiralty operations had had perhaps the perfect pedagogical experiment. They were a fresh unit from the states without any experience at all in war surgery. A few of the men had had a moderate amount of industrial experience, but only moderate. They had some didactic instruction on the proper care of the soft part wound, which is the fundamental thing in combat work. Then they had the useful clinical experience of going to one of our hospitals and working in that hospital with cases coming from another area where implicit faith in the sulfa drugs had been exhibited, and this implicit faith in the sulfa drugs was not complemented by adequate care of the soft part wound.

These men had had their didactic instruction. Then they had their clinical demonstration of what happened when the right care of the soft part wound was not given. Then they went into action in the Admiralties. The treatment of the cases that came back from that unit were not exceeded in my experience in the Southwest Pacific. It was a splendid performance. I know what they were told about the use of sulfa drugs in the wound; and believe that they didn't use much sulfa locally in the wounds. They did give superior surgical care to the soft part wound and used immobilization extensively. They had no gas infection, and only 10% required wound revision.

After all, if you can produce a clean, incised wound by operative care of a contused, contaminated, lacerated affair, you have healthy, living tissue forming the walls of that wound. The cells lining that wound want to heal that wound. If you can support the nutrition of the man, if you can prevent further contamination to that wound, if by your systemic use of any of the bacteriostatic substances—the sulfonamides, or penicillin organisms—and can build up around that wound a bacteriostatic zone, you will not have invasive infection. The cells forming the wall of that wound can go through all the little changes they want to go through in order to close that wound, and healing will begin.

Then, of course, to that wound can be applied what has been found so successful in the past year or so, namely, secondary closure. That is particularly apropos of compound fractures, which is a whole subject in itself. But I firmly believe that there is enough experimental evidence to show that even though the sulfonamide is perfectly applied, there is some delay in repair. Somebody just recently, two or three months ago, in the *Journal of Surgery, Gynecology & Obstetrics*, published some sections of wounds treated with sulfa drugs and without. They healed up all right, but almost without exception the scar was thicker and heavier in the sulfa drugs than in the control group, which indicates that there had been some kind of an effect on the epithelium, and, one can assume, an irritating effect on the whole wound area. If I had a compound fracture, abdominal or other severe wound, I would be perfectly ready not to have the man put any of the sulfa powders into my compound fractures or head wound or belly wound, but would want either penicillin or one of the sulfonamides systemically.

I don't know how, DR. BROWNING, we are going to recognize for sure the apparently innocent contusion that isn't so innocent and that is going to go on and produce the lesion that you speak about. That is when one of those strokes of judgment on the part of the operating surgeon is called for that is either God-given or luck, and perhaps a little of both. Certainly if one suspects impairment of circulation to an area of bowel, one must resect it. I don't think there is any question about that. When you brought up that question of contusion, something came up which I didn't speak about in the paper on purpose because it really was a little more thoracic than abdominal, and that is the question of the blast injury. The majority of the blast injuries that are done above the water will be largely on the chest and less severe in the abdomen. The ones that are from a depth charge with a man floating in the water will be largely abdominal and less thoracic. In the majority of those cases there is not much doubt as to the diagnosis. The man has pain in his chest; has cough; brings up blood; he has obvious anoxia, usually a wet lung; then he will have some abdominal signs which are often not severe. He may pass blood per rectum. The only autopsies I saw on any of those cases had such extensive lesions in brain, lung, entire intestinal tract, and some of the solid abdominal viscera, that operation obviously would never have done any good at all. The minor ones probably do have some hematoma in the wall of the bowel and perhaps in the mesentery itself that do not go on to necrosis. Abdominal exploration is advised against in case of blast injury unless there is some definite indication. But the differential diagnosis on those doubtful ones that are going to cause trouble later on, I think that is a matter of inspiration at the moment.

Action Now—For a National Medical Plan

—A Plea for an Ethical "Package Plan"—

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THE TIME for united action is here. Doctors must awaken and cooperate with one another and with hospital people now to plan, organize and promote voluntary prepayment medical care plans. Unless full understanding of this need develops, soon national legislation embodying compulsory health insurance will become an accomplished fact. It is difficult to exaggerate the importance to medicine of immediate action!

Medical care plans operating in conjunction with hospital service plans are beginning to take root; actually, these plans are now in operation in 19 states. They are serving the needs of 1,600,000 Americans to the satisfaction of the patients, the doctors and the medical societies. But their growth is not rapid enough, nor does it give assurance that tomorrow there will be a sudden mushrooming of these plans and participants in numbers so large that the threat of Federal or state operation of medical practice will vanish.

What is called for now is active cooperation by every doctor of medicine. Without delay, the state and county medical societies should promote and organize medical care prepayment plans in their own regional areas. A pattern for the development of these plans has been offered in the recent proposal published by John R. Mannix, Chairman, Hospital Service Plan Commission and Executive Director, Plan for Hospital Care, Chicago, for an "American Blue Cross"; this was an urgent appeal for a national voluntary prepayment plan for unrestricted hospital and medical care. His evaluation of the subject appears to be of sufficient importance so that a corollary—from the standpoint of the medical profession—should be forthcoming, to underline the need for genuine cooperation of organized medicine with the already magnificent results of the Blue Cross Hospital movement.

Mr. Mannix proposes that any plan for prepayment of health services should include five features: (1) It should be under the sponsorship of medical and allied

professions and non-profit hospitals. (2) It should be voluntary, rather than compulsory. (3) It should assure the individual free choice of physician, dentist and hospital, with no interference with the professional relationship between physicians, dentists, and patient, or between physician and hospitals. (4) It should place emphasis on the public welfare, and should be non-profit in operation. Any surplus which might develop should be used for the benefit of subscribers in the form of reduced rates or increased benefits. (5) Benefits should be comprehensive and without restrictions or limitations.

This plan, he points out, would be "free of political control, compulsion and denial of free choice of physician, dentist and hospital, and would provide that economic stability in American health care which would stimulate rather than hamper further scientific progress." It would be desirable, Mannix says, for such an organization to be established under a federal charter similar to that which has been granted the American Red Cross and the American Legion to coordinate and guide medical and hospital plans. The board of trustees would be selected by the American Medical Association and the American Hospital Association, each selecting half the total. When dental and nursing services are offered, the board should be expanded to provide their representation.

The Council on Medical Service and Public Relations of the AMA recommended to the House of Delegates at the June, 1944, Convention, the following resolution:

"Resolved, that the American Medical Association effect leadership in encouraging and aiding state medical societies immediately to inaugurate voluntary prepayment medical plans, or to expand as rapidly as possible existing programs, in order to fit community needs, to bring service to all the people, and to prevent waste and confusion in medical practice which will result from a government-operated compulsory system."

In 1938 the House of Delegates of the AMA in a resolution favored medical care plans sponsored by constituent medical societies on a cash indemnity basis. Three years later (1941) the resolution was amended to include favoring medical care plans established to operate with payments directly to the attending doctor, or on a "service basis."

Dr. Herman Kretschmer, President of the AMA, speaking at the Annual Conference of Secretaries and Editors of Constituent State Medical Associations, November 17, 1944, had this to say on the subject:

"In my travels through the country, attending various state meetings as well as other medical meetings, the subject of greatest interest among physicians was prepayment medical plans. Many state societies had this subject under discussion and were ready to adopt a plan or had adopted one. Many of the members had but vague ideas about the actual working of the plan under discussion. There has been a definite upward trend in both the number of plans in operation and the number of people participating in these plans. For that reason I am glad to see that your conference has these plans under discussion. We are the best insured country in the world. Upward of 60,000,000 people carry life insurance. This wide distribution is the result of education; I believe we can educate the people to insure themselves against sickness and hospital costs. To provide for protection against illness, is, I believe, the privilege of the citizen. I do not believe that the people of this country are so incompetent that the government must do this for them."

These pronouncements emanating from "high places" illustrate the growing professional appreciation that voluntary prepayment medical and hospital care plans are the answer to an ever increasing demand for a national health service program.

The development of a medical care plan is not difficult. In the early stages of its development a medical plan doesn't expect to function to perfection, nor are its benefits at the maximum it hopes to offer later. However, with physician cooperation and rapid public acceptance, plans do not remain long in a foundling stage. A typical recent example is that of the New Hampshire Physicians' Service, of Concord. This plan began operation the first of August, 1944, and has already enrolled some 1,500 members for surgical service and 500 for medical service. The plan operates in conjunction with Blue Cross hospital service in the area. Still more recently, in January, 1945, the United Medical Service of New York launched its plan providing medical and surgical care for low income families. Under this plan surgical and obstetrical care are available to the subscriber for as little as $0.52 a month; free choice of physician is maintained; cooperation with the Blue Cross hospitalization plan is provided for.

THE California Physicians' service has recently issued its fifth annual report, so comprehensive as to various phases of the plan's operation as to form an excellent guide to other state and local medical associations considering the establishment of a prepayment plan. As the first state-wide plan, California has been forced to experiment in many directions. It has issued several types of contracts, and still retains a number of these as suited to special conditions. Its dues each month are $0.60 for male employees, $0.90 for female employees, $1.50 for an additional dependent and $2.25 for two dependents. Participation is limited to those persons with incomes under $3,000 a year, to whom all contracted services are granted.

The largest and most successful of the plans sponsored by the medical profession is that operating throughout the state of Michigan which was organized by the Michigan State Medical Society and began operations in February, 1940. This plan offers surgical and obstetrical benefits and has now been made available to over 750,000 Michigan residents, or one out of every seven persons in that state. The monthly rates charged for the service are $0.60 per month for the single person, $1.60 per month for man and wife, and $2.25 for man, wife and children. Payment to physicians now exceeds five million dollars annually, and, as of December 31, 1944, the plan had a surplus, over and above all liabilities and after repaying loans made by the Michigan State Medical Society, of over $194,000.

The above plans, like all the others, believe in the logical and sound adage, "Leave medical matters in the hands of medical men." They believe that medical plans should be operated by, and kept under the control of, the official regional medical organization, and should be operated on a non-profit basis—in cooperation with the local Blue Cross plan.

The advantages to be derived from medical care plan operation in conjunction with Blue Cross are many and obvious. First, of course, is the impetus of Blue Cross growth, which already totals 18 millions and is adding new subscribers at the rate of over four million a year. Not less tangible is the good-will that accrues to the doctors who in the final analysis are to a great extent responsible for the successful operation of the Blue Cross plans. Additionally, costs of

management and enrollment can be held to a minimum through joint operation. Moreover, hospital people understand medical ethics. Thus in the operation of a joint hospital-medical plan for sickness benefits, the all-necessary communications transmitted from the plan to doctor and from doctors to the plan will be treated in every respect within the limits imposed by the professional ethical code.

Whether the set-up is to be on a cash indemnity or service benefit basis is less important for the moment than the question of whether or not there is to be a medical plan at all. There are sound arguments on both sides of the question. However, the service benefit program appeals to me as one which will more nearly meet all demands of the public and will best amplify the already successful hospital service benefit program. Through the establishment of income limits above which the doctor is permitted to collect an additional fee for service rendered, the objection that a service plan works a hardship on the participating physician can largely be eliminated. Then, for families within the established limit, the service benefit offers that full security from sickness expense which it is the object of all such plans to provide. Moreover, it is only by thus providing such full security that the threat of government intervention through compulsory insurance can be wholly met. A cash benefit program may too easily become simply an insurance operation offering partial protection to families who do not particularly need it. Furthermore, service benefits offer the greatest degree of uniformity with the Blue Cross hospital plans and will promote the harmonious, coordinated joint operation which is so desirable now.

The nation's hospitals have taken the lead and have demonstrated by experience the soundness of voluntary insurance against sickness expense. Why hospitals have taken the lead and the medical profession has been more or less hesitant to join wholeheartedly in the movement is beside the point now. The time for an essential "about face" by organized medicine is here.

For one reason or another, some prominent medical men have the erroneous impression that Blue Cross Hospital Service Plans are contriving to gain control over professional activities in connection with the campaign for a joint program, national in scope, of universal health benefits—the appeal for medical cooperation for an "American Blue Cross" with a universal comprehensive contract providing hospitalization and medical care benefits. The truth of the matter is that leaders of hospital service plans want no part in the control of medical aspects of medical care plans. They, too, believe that medical matters should be left in the hands of medical men. They do now and have always insisted that if and when medical care plans are instituted they should be maintained under the auspices and supervision of the medical profession and it should be stated here that many hospital service plans are cognizant of the fact that without professional goodwill and cooperation there is some doubt that they could survive.

What the hospitalization plans are saying to the profession is in effect this: "During your survey and study of medical care plans, during the process of promoting and establishing your plan and in connection with your policies and procedures of administration, the hospital care plans will place at your disposal their complete office and administrative facilities, actuarial data, bookkeeping and accounting systems, including the personnel needed for handling these and other aspects of the venture." Not to the slightest extent do they desire to formulate, dictate or control professional aspects relating to rates, benefits or types of services, nor to adjudicate claims for benefits. Every phase of the administration of medical care plans must be under the supervision and control of the medical society under whose sponsorship the plan operates. A goodly proportion of boards of directors in hospital service plans are medical men.

Hospital service plan people believe that there is a universal demand for a program of prepayment of medical care and that this demand is irresistible and is going to be met by some group, either government, industry, labor unions, commercial insurance companies, or the medical profession itself. Hospital plan people believe that the demand should be met by the medical profession. They stand ready to make available to the profession all of the experience they have gained in developing prepayment for hospital care. They are sincere in their belief that, as hospitals direct prepayment plans for hospital care, the medical profession should direct prepayment plans for medical care. What could illustrate more genuinely the sincerity of purpose of hospital service plan executives in this connection than their insistence that medical matters be kept in the hands of professional men?

The all-important point at present is the necessity for the decision by the medical profession that prepayment medical care plans must be formulated to operate in conjunction with the nation's hospital service plans. All thinking and planning today should be along the line of a comprehensive national contract including transfer privileges and complete reciprocity of enrollment and benefits. A national medical care contract with unified benefits adopted early will obviate the troublesome necessity at some later date of national conferences to correlate and unify several local and state contracts into a comprehensive national document. A unified effort along this line could be provided by bringing together in a national unit the medical men in every state medical association who already are sympathetic toward voluntary prepayment medical plans and who understand the essential basic principles that have been so successful in the Blue Cross Hospital Service Plans.

The immediate proposal is to marshal these men into a constructive, organized force with the view of forming a Medical Care Plan Commission comparable to the Blue Cross Hospital Service Plan Commission. With this Medical Plan Commission at the helm, its members preferably elected and approved by the various state medical societies, a driving force toward a national contract for hospital and medical care would exist.

IN THIS connection there is one pioneering group of medical men, representatives of the already operating medical service plans, that deserve the attention and sympathetic understanding of all members of organized medicine. The organization is known as The Medical Service Plans Council of America, fully organized and operating under adopted constitution and by-laws declaring its purpose as "The Corporation shall seek mutual joint action on a national scale by all voluntary, non-profit prepayment medical service plans organized or sponsored by local, county or state medical societies in the United States of America and Canada.

"It shall seek to develop this voluntary movement in such manner as to protect the public welfare and wholly safeguard the high quality of medical care achieved by the profession in the United States and Canada.

"It shall seek to develop the autonomy and rights of local communities to evolve their programs according to local needs and practices, striving at the same time, to coordinate their methods into as uniform a national pattern as possible. The corporation shall develop its purpose by sponsoring programs and meetings; by collection and circularizing local experiences, information and actuarial data; by research and reports that will be of value to its members.

"The Medical Service Plans Council of America shall sponsor cooperative and working relationships with medical and allied health groups whose activities in the voluntary field coincide with the broad specific purposes of this organization.

"The establishment of this Council for the provision of extending availability of medical care to all people in a manner consistent with the ethics of the American Medical Association is predicated on the belief that its efforts of service to the people and the profession merit official recognition as an accredited Council of the American Medical Association."

Medical Societies contemplating the promotion and organization of a medical care plan would do well to seek helpful information and actuarial data collected by research and reports of local experiences from The Medical Service Plans Council of America.

The ideal and practical solution would be for the American Medical Association to assume leadership and sponsor a national medical service plan commission, comparable to the Hospital Service Plan Commission already constituted and operating under the leadership of the American Hospital Association. In this connection with complete unity of purpose and harmonious working arrangements by and between the American Medical Association and the American Hospital Assciation, there would surely be established a national system embodying complete medical care and hospitalization benefits. National enrollment would be stimulated and, without too much delay, a huge majority of the American public would be protected. The apparent need for a government-operated compulsory tax-paid system would disappear quickly when such a program became fact.

In this connection another national organization of physicians that stands in a particularly favorable position to contribute toward mutual understanding and full cooperation is the AMERICAN ASSOCIATION OF INDUSTRIAL PHYSICIANS AND SURGEONS. To sponsor, promote and supervise a nation-wide prepayment medical care plan by Doctors of Medicine necessitates the initiative be taken by a physicians' national organization for the reason that unity of purpose and harmonious working arrangements on a national basis cannot be had without sovereignty being held by a national body.

The time for thinking and talking about a national sickness benefit plan has passed, and the time for action has arrived. There is no alternative; disinterest and procrastination may mean non-survival for voluntary hospitals and invasion of professional independence. Unyielding cooperative action *now* means universal health benefits, voluntarily subscribed to and under the control of medical and hospital people.

Since 90% of medical and hospital plan growth stems from employer cooperation, it is hardly necessary to point out that employer cannot be overlooked in any consideration of future health care plans. Some 200,000 employers have been sold on the value of hospital protection for their employees. Realizing that hospital care is but a small part of the cost of sickness, employers are urgently requesting, and national employers are demanding, a single contract providing hospitalization, surgical and medical coverage—a contract known as a "package plan." The practical minded employer asks, "Why can't we have a single program covering medical, surgical and hospital care, instead of two or three separate plans?"

Why, indeed, can't American doctors and hospitals collaborate and cooperate to offer a comprehensive contract with unified benefits to cover the health needs of the nation's workers and their families? Without collaboration of hospitals and physicians for a nation-wide "package plan" the impetus already gained by hospital service plans may be lost, and a different kind of package will be presented to the public from some other source. The American way to do it is the American Blue Cross way, through presenting a hospital and medical care plan national in scope on a prepaid voluntary basis and under the control of hospital and medical people!

Industrial Medicine and Surgery

—An Economic Interpretation—

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RARE indeed is the physician who has held any regular industrial connections for long without soul-searching communion with himself, his friends or his employers about money. It is the part-time and full-time physicians in industry who seem most painfully and persistently harassed. Some of the surgeons downtown who see industrial accident cases also have complaints, yet their problems are essentially different.

The best indication of the delicacy of this subject is that no articles appear to devote themselves to it. Questions of pay status for physicians in industry are reduced to occasional paragraphs of the most nebulous type. Nevertheless economic objections provide one of the chief obstacles to a more extensive utilization of medical services by industry. A clear statement of the current financial arrangements in this field would not only be helpful to industrial management faced with making decisions in such cases but might also provide a basis for guideposts by which we as physicians may anticipate future trends.

We have already noted that there are divergent types of association between industry and medicine and have proposed to examine these from the perspective of money. Our inquiry might open most reasonably with a summary of the earliest and still by far the most prevalent type of relationship between industry and medicine—surgery for accident cases.

Orthopedic and Traumatic Surgery

CERTAINLY the first health need in any industry is the development of a competent and convenient arrangement for handling accident cases. Before industrial insurance companies had developed convincing statistics it was generally the custom (and this is still fairly applicable to companies that carry their own insurance) to select a doctor for this specialized need on one of two bases: *first*, because of his personal friendship with the industrial management (in which case considerably more than an average industrial fee might be paid, for a while); *second*, because his office was in the neighborhood and his services could be obtained at very small cost. Of course the insurance companies discovered that, alone, neither of these methods of selection was adequate; that the best results were obtained by having accident cases cared for by doctors with special training and experience in the specialized fields of orthopedic and traumatic

surgery, and further, that such surgeons could only be permanently interested in this work by having a sufficient volume of business to make the insurance fee schedules attractive.

The establishment of rather fixed fee schedules was inescapable with a fee-for-service basis in great volume. Medical fees allowed for industrial accident cases vary slightly from area to area—the exact amount for any given case may be found by calling the claims office of any industrial insurance company. Generally, the surgeon is allowed from $2.00 to $3.50 for the original visit of an injured employee to his office, and from $1.00 to $1.50 for subsequent visits or redressings. On the original visit the surgeon is customarily allowed a dollar extra for each suture that is needed. In addition, rather detailed fee schedules have been established for all the more complicated surgical needs. Only by the assurance of a large volume of work would such fees be acceptable, especially when rather detailed reports must accompany all medical bills. Yet, with the employment of nurses and younger physicians, these conditions can be met with competent service and very real profits. These arrangements afford the surgeon an opportunity to develop the dexterity, judgment and good results that are frequently associated only with considerable experience.

The practical standardization of fees and the channelling of most of the accident cases through a few surgeons have done much to simplify the administrative problems of insurance companies. The general improvement in the quality of surgical service for accident cases has been beneficial for all. But the gradual evolution of these arrangements has developed two increasingly painful points of friction.

First, the reaction of industrial management in the local company. Particularly in the larger urban areas the industrial clinics that have grown up to handle the great volume of industrial injuries are centrally located, while the industries are frequently on the outskirts of the community. The time and cost required in transporting injured employees to and from the industrial clinics have too often been overlooked. The careful foreman does not overlook these inconveniences—they are charged against the operating cost of his department. The distance to the large industrial clinics has undoubtedly resulted in many of the infections and lawsuits that arise from neglect. These clinics that dominate their field in almost every urban area must inevitably expand into many local substations. If this need is not met by the surgeons themselves they are almost certain to lose the initiative to industrial management, insurance companies or the government.

The second point of friction arises from the general practitioner who sees industrial accident cases only occasionally. Since he is not retained as a consultant he must accept the usual fee schedule. This means he sometimes receives only part of his normal fee for taking care of his own patients—just because the given injury occurred at the patient's place of employment. The settlement of such accounts through an insurance company's claims office has led to the frequent and invidious comparison between Shylock and the insurance companies. Obviously such a fee schedule has no real justification under these circumstances except that it might discourage a doctor who is not too competent from interesting himself in the field. Nevertheless such adverse experiences have occurred in the private practice of almost every physician, and this has done little to help the professional relations of insurance companies. A more generous and patient attitude on the part of local insurance claims offices toward these occasional cases would do much to avoid prejudice.

We have stated our belief in the necessity of this service being readily available. This does not mean that surgical service need be or even should be an in-plant service. Indeed, we intend later to show how and why specialized surgical services should not be available in the plant itself.

Yet effective care for accident cases is only part of the health problem for which expanding industrial management is finding it must assume some responsibility. The rest of these health problems are in the fields of diagnosis, toxicology and the administrative and industrial relations aspects of group health, safety and welfare. These services are part of a large field that is referred to, a little optimistically, as preventive medicine. They are scarcely services that one should reasonably expect of a competent surgeon. Yet what could be more natural than that companies would turn to the surgeons handling their accident cases for this additional help?

Thus, well-meaning pressure has been brought to bear on traumatic and orthopedic surgeons. This pressure has placed many of them in a most anomalous light. Some have gone into the larger industries on a flat salary, since this could be comfortable to both parties where a sufficient amount of accident work was present; some have ignored the pressure, realizing their lack of qualifications for and interest in the other work; some have refused to see further industrial accident cases because their motive had become suspect. It can easily be seen that these results have answered few problems. The primary result seems to be the development of undercurrents of apprehension and dissatisfaction among the surgeons involved exclusively in industrial accident work.

Obviously the best interests of the injured worker, his industrial management and the insurance companies would be much better served by avoidance of injuries. Yet, to expect the orthopedic or traumatic surgeon to learn the complicated techniques of a preventive industrial medical program when his chief source of income is from reparative surgery is to argue that a man will work his hardest to reduce his own income.

The Standard Compromise

TO MEET these needs an arrangement has been developed that is now rather generally used by most medium-sized companies. Much real help has been made available to industrial workers and management through such medical service. Yet some of the financial and administrative bases of this newer arrangement need review.

Some physician in the area is designated as "plant doctor." All of us are familiar with part-time plant doctors—the ones who do the pre-employment examinations and handle the accident cases for the X manufacturing company and the Y foundry. It is an arrangement that most frequently appeals to young physicians while they are getting a private practice started, or older physicians whose health necessitates their limiting their efforts. Since the most prominent physicians of the community are seldom associated with its industries on this basis, let us consider some of the reasons.

The contract between these physicians and their industries is usually based on a small hourly or annual retainer—customarily $2.00 to $3.50 an hour. For this money the physician agrees to examine all new job applicants and such other minor medical services as may lie within the vision of the company at the time. The retainer fee is paid by the industry, and

its size is justified by an agreement that the insurance company will supplement it by additional payments for the physician's management of any accident cases that occur in the plant. Thus the industrial physician is placed in a position where he feels obligated to care for the more complicated surgical needs that may arise—needs that he may not be too well qualified to meet. On the other hand his surgical training may have been good and his problems may arise from his obligation to give competent advice on job placement in vascular diseases or chest pathology.

Because of the scope of his responsibilities, a tremendous breadth of specialized knowledge must be presumed among such physicians. It may be presumed but, as we have noted, it is seldom paid for. Nevertheless such physicians are frequently paid twice for the same job—once by the plant on an hourly basis, and again by the insurance company for handling accidents and redressings while at the plant—sometimes, too, from private patients seen during this time.

To further complicate the relationship, the retainer is practically never increased. Instead, reasons are advanced to justify the fact that the retainer becomes smaller with the passage of time. The physician in these circumstances ultimately feels victimized and retaliates in the only way possible for him—he declares more and more health problems to be "compensation cases." Is it surprising that the insurance division in such plants finds its medical bills slowly but steadily rising? And that friction may develop between safety, personnel and medical departments? And that the turnover of these physicians is extremely high? People and statistics have been subverted with less motivation.

Certainly if one is to expect a high degree of competence, permanence or satisfaction a more effective working basis for this service must be developed.

Industrial Medicine

WE HAVE considered some of the problems that result from an unsound basis of selection of physicians, and from misunderstandings over questions of pay status. There must be a method by which the best interests of all concerned may run more parallel courses. This would seem to be part of the challenge if industrial medicine is to develop into a real and recognized specialty. To meet this need, industrial medicine would be defined as the application of diagnosis to physical capacity analysis, job placement, health supervision and environmental control of employed groups. Obviously for this job the physician selected should be competently trained in internal medicine—diagnosis—since accuracy of diagnosis is fundamental to the long-term effectiveness of his job. To function properly it is imperative that this service be available *within* the plant.

Since our inquiry is fundamentally directed toward a clarification of the economics involved in such a relationship, we are faced with the unpleasant question of how and how much such a physician is to be paid.

The scope of a physician's functions in an industry need not be restated here. There are currently a number of excellent articles and some books dealing with this latter subject. Suffice it to say that, while most of the physician's work is diagnostic or therapeutic, a great deal of it is purely administrative. An individual fee-for-service basis has never been satisfactorily worked out, therefore an hourly salary seems almost inevitable since any other pay status might ultimately be exploited by one party or another in such a contract.

So industry will pay the physician an hourly salary —what is to determine its amount? This may vary slightly with living standards in the area. Yet if one anticipates retaining a physician of competence on anything like an amicable and permanent basis this salary will rarely be less than $5.00 an hour—the amount such a physician would expect to make on house calls.

At this price an industry should expect competent service. Some industries may find it more expedient to employ a medical director who would be responsible for procedures and policies in the various operating units of that company. This would make it possible to retain local physicians at $3.00 to $4.00 an hour after the policies and procedures of their work had been fairly well outlined.

Problems in industrial medical programs usually arise from expecting such physicians without previous background and special training in their job, to establish clear and effective health policies for the company. When starting a medical program in a plant without the aid of a medical director in the home office an individual company might save time and money by retaining an industrial medical consultant familiar with the more common pitfalls and best current practice. This latter physician would be responsible for the establishment of the service and could return periodically to iron out administrative, toxicological or other burrs from the program. Because of the shortage of thoroughly qualified physicians available for individual plants and because problems in industrial medical departments usually originate on the same bases, it is surprising that more use has not been made of industrial medical consultants by industry.

At $5.00 an hour, a 40-hour week would cost industry $200 for local medical services. Yet in normal times an industry employing 500 to 700 people would not need such a physician in attendance more than an hour or two a day. Much of his work can be delegated under written standing orders to competent industrial nurses. The full-time employment of a physician in plants of this size envisions a complete medical care program for all employees—and sometimes their families as well. This latter type of service is not industrial medicine. It is a group prepayment health program. With a few brilliant exceptions, the quality of industrial medicine usually suffers with this expansion.

We have gone into some detail in discussing a financial basis for this service. There is another relationship that must be clarified. Industrial medicine is not a replacement for industrial surgery; it is an essential and preventive supplement. Since it is specifically designed for industry it must appreciably reduce the need for reparative surgery. No company should expect its physician to assume complete charge of major injuries. If the physician is entirely competent for such responsibilities he is probably not adequately prepared to meet the daily diagnostic problems, as we have stated. This is not said by way of disparagement. It is only honest recognition of the fact that even the best machines have their limitations. However, since there must be some mutual responsibility between industrial medicine and traumatic surgery for the management of most accident cases, a delineation of their respective fields might prove beneficial.

It is certainly reasonable to expect the industrial physician to assume responsibility for minor injuries. For this purpose a minor injury may be defined as one not requiring specialized surgical or ophthalmological attention. This would probably include all accidents up to lacerations of the skin needing an occasional dermal suture or foreign bodies that are not embedded

in the eye. However, these minor injuries constitute more than 90% of the accident problems in most industries. To help in avoiding any awkward arrangements between physicians over these accident cases a method is proposed by which a bonus incentive could be created on a simple and effective basis.

It is easy to compute for any company its expected annual medical cost. As an example, a company with a compensation premium of $10,000 a year would employ approximately 500 to 700 people. Physician's bills arising out of accidents in such a plant would be expected to be about $1500. It is proposed that this amount of money be set up as an entirely independent fund. If the industrial medical department's services are sufficiently effective to avoid the need for its expenditure the resultant saving should be divided between the physician and his industrial nurses on some prearranged basis, probably as a Christmas bonus. This should create a very real incentive. With any major accident the medical department would see its Christmas bonus dwindle.

From these meager statistics it must be immediately apparent that by far the largest part of the compensation premium is not spent on medical cost. This larger amount would be saved by the company—this is usually more than enough to cover the cost of the industrial medical program.

Summary

INDUSTRIAL SURGERY: 1. Special training in orthopedic and traumatic surgery.	INDUSTRIAL MEDICINE: Special training in internal medicine. Experience in physical capacity analysis and industrial toxicology.
2. Readily available; not essentially in the plant.	Must be an in-plant service.
3. Fee-for-service.	Hourly wage.
4. Consultative service for accident cases.	Part of plant employee service program.

10 YEARS AGO in "INDUSTRIAL MEDICINE"

WILLIAM CABELL MOORE, M.D., "Industrial Medicine and Medical Ethics," in INDUSTRIAL MEDICINE, June, 1935: "Is it right for an attending physician to give 'anemia and rundown condition' as the reason for advising six weeks' absence from work during which the patient's wages will be paid as sickness benefits, when as the company learns later the physician has not made a blood count, and examination by a company physician shows that the employee is not anemic but just tired, possibly from home work or social activities combined with business duties? Or should a physician give 'low blood pressure' as the reason for advising indefinite absence during which the patient will be paid benefits, when the blood pressure is normal? Or give 'acidosis' or 'some obscure infectious condition' as the reason for indefinite absence during which the patient will be paid benefits, when the condition is pregnancy for which the patient is not entitled to benefits? Or give 'inguinal adenitis and abscess due to injury while at work' as the reason for prolonged absence and a demand that the company pay for the treatment, when the trouble is due to syphilis and the man has a 4 plus Wassermann? Or to diagnose 'hernia due to strain while at work' when there is no hernia? Is it right that a person receiving sickness benefit should be allowed to take six to eight weeks to recover from an uncomplicated appendectomy, and three or four weeks to recover from common colds or simple indigestion? Shall the company allow an employee to be treated for neurasthenia when he has tuberculosis? Or be made to pay a large sum to a malingerer because some misguided doctor says the individual has traumatic neurosis? All these things have actually happened and similar cases are coming up constantly."

Methyl Bromide Intoxication

—Of a Large Group of Workers—

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SINCE instances of methyl bromide poisoning have been reported previously, justification for this article is found only in certain unusual aspects which it presents, some of which have a "teaching value."

The Episode

DURING the latter weeks of December, 1944, 34 known cases of methyl bromide intoxication developed in the Date Packing Industry at Indio, California. An estimated 15 to 20 more packers were absent from work for a period of two to 10 days but did not consult a physician. A description of their illness as given to their employer would indicate that they, too, suffered from a mild methyl bromide intoxication. As of May 1, 1945, four of the known cases claim a permanent disability, six are classified as still being "on temporary disability," and the remainder have no disability.

Dates are delivered to these plants in lug boxes which are placed each night in fumigating rooms where they are subjected to a charge of methyl bromide for a period of 12 hours. In the morning the operator starts the suction fan within the fumigating room and opens the door leading to the packing room. After a short period of ventilation, the boxes are trucked into the packing room and dumped onto a conveyor belt which carries the dates to a shaker and then onto a sorting belt. The dates are graded and packed into boxes by hand, and then returned to the fumigating room.

The Cause of the Mass Poisoning

WHILE the clinical study of these patients was made by the writer, the hygiene survey of the plants was conducted by DR. HAROLD CASTBERG, Director of the Division of Industrial Hygiene of the California State Department of Health. For inclusion in this report, DR. CASTBERG submitted the following information:

"The trouble apparently stems from the general misconception of the toxic nature of methyl bromide. Most of the packers in this area were under the impression that it was practically non-toxic. At the present time the safety orders of the Industrial Accident Commission list the maximum allowable concentration as 50 p.p.m., but recommendation has been made to reduce this figure to 30 p.p.m.

"Although the method of charging the fumigation chambers is apparently satisfactory, it was discovered that the operator was exposed to many times the toxic limit; that many of the fumigating chambers were not constructed tightly enough to prevent leakage of the gas into the workroom area; and that, in one instance, the charging valve permitted an escape of methyl bromide directly into the packing room. The greatest danger, however, comes from the method of purging the fumigation chambers following the fumigating period. In most instances, there was no positive exhaust and fans were usually placed in the doorways to blow the fumigant from the rooms. This procedure caused the methyl bromide to be blown into the general packing room where concentrations of 100 to 500 parts per million were found. Also, the operators of the fumigating chamber grew careless by permitting the lugs of dates to be removed from the chamber into the packing room before a sufficient ventilation period had elapsed."

The Clinical Picture

BEFORE detailing the findings as revealed by our study of this group, the accepted clinical picture of methyl bromide poisoning should be mentioned. We are not interested at this time in the effects of a sudden exposure to high concentrations of this gas which produce irritation to the respiratory tract such as edema of the lungs or bronchopneumonia. The prolonged exposure to small amounts results in varied, multiple symptoms and signs of central nervous system involvement. These include visual disturbance, ataxia, numbness of the extremities, apathy, somnolence, hallucinations, melancholia, coma, convulsions, and maniacal states.

The following table reveals the reaction of the 34 cases poisoned by methyl bromide at Indio, California:

	Severe	Moderate	Mild	Few Days Duration	Few Weeks Duration	2-5 Mo. Duration	Possible Permanent	Total
Visual disturbance	2	7	25	27	5	2	0	34
Speech disturbance	5	8	10	23	0	0	0	23
Mild mental confusion			15	15	0	0	0	15
Hallucinations	7			7	0	0	0	7
Melancholia			2			2	1	2
Coma	4			4	0	0	0	4
Convulsions	1			1	0	0	0	1
Apathy	1						1	1
Tremor			4		3	1		4
Neurosis		2					2	3
Fainting attacks			3		2	1		3
Numbness of extremities			18	4	11	3		18

It is interesting to note the presence of a visual disturbance in every case and the high incidence of numbness, speech difficulty, and ataxia. The first three cases to present themselves to the local physicians did so because of their disturbed vision. After eliciting other complaints, such as a "thick tongue," two of these first three patients were suspected of being "on the verge of a stroke." Other interesting phenomena will be brought out in the following case histories. Obviously, space prevents giving case reports of all of these cases.

CASE 1. F. K. Age 34, widow. First complained of feeling run down and tired for a period of two weeks, then reported to her physician because of double vision. Developed a paretic type of speech, could not enunciate, and then could not choose the correct words to convey her meaning. A maniacal state followed a period of hallucinations. Screamed, raved constantly that someone had killed her child and was attempting to kill her. Mental condition cleared after 10 days. Three months after her acute illness this patient complains of occipital headaches, fainting attacks, pain and tension in the cervical area, numbness and tingling of the extremities, and occasional fainting attacks. Her physical examination is normal and there is no evidence of optic atrophy.

CASE 2. H. E. Female, age 56. Like the previous case, this patient noticed she was tired. Her first intimation of anything seriously wrong was when she signed her day slip and noticed that she saw two rows of figures instead of one. Two days later her family noted that she made wild remarks and her speech became thick. She then developed hallucinations, believing there were lugs of dates stacked in her room and under her bed; that men were in her room painting these lugs. During this period she was exceedingly loquacious although her family could not understand her since her speech was "thick" and disconnected. Her visual disturbance persisted for two months. Four months after onset she claimed to be nervous, weak, had frequent headaches, and numbness of lower third of each leg. Her physical examination on May 16 was normal.

CASE 3. R. O. D. Male, age 30. Operator of a fumigating room. First noticed blurred vision, then "purple" vision, and soon became nearly blind. Developed hallucinations, slurred speech, and hesitancy in the choice of his words; was disoriented, and about five days after the onset of his symptoms became semi-comatose. A check-up examination three months later revealed the eye muscles weak to the right; 20/50 vision of the right eye, 20/40 of the left; color vision inaccurate and the patient complained of eye strain—"that his eyes got tired after reading a few minutes." Otherwise patient had no complaints.

CASE 4. A. V. Mexican male, age 38. First noticed blurred vision, then an unsteady gait. Wife accused him of being drunk on his return home from work. One odd complaint was that "when I want to step forward, I step backward." Eventually showed evidence of hallucinations, numbness of the legs, and weakness. These all cleared up after a period of three weeks.

CASE 5. K. P. Female, 55 years old. For a period of one week her fellow workers noticed that she would make strange remarks and then, while at work, she became irrational; picked at imaginary objects on her body, made passes at imaginary objects in the air, claimed lights were flashing into her bedroom window, spoke German (her native tongue) for the first time in 20 years, and would pray for hours. Her gross mental abnormality cleared after three weeks, but four months after her onset she remains apathetic and listless. Complains of buzzing in her ears, a choking sensation, pains in her chest, and insomnia. Aside from a mild hypertension and a hesitant gait, her physical examination made just prior to this report was completely normal.

Laboratory Findings

NO ATTEMPT was made to determine the presence of methyl bromide in the blood of any of these patients. Otherwise they were subjected to a thorough investigation which included the urine, spinal fluid, blood chemistry, blood counts, serology, and agglutination for typhoid, paratyphoid, and undulant fever. No significant findings occurred in the urine, spinal fluid, or blood chemistry of these patients; two revealed a moderate anemia, and in one instance there was a weakly positive dilution for typhoid.

The Psychological Reaction to Methyl Bromide

IN ADDITION to the interest which lies in the clinical picture depicted by this large group of cases, the primary impetus behind this report is the attempt to bring before the industrial physician the latest conception of the reaction of methyl bromide within the body. A considerable amount of scientific study and animal experimentation with the industrial chemicals is reported in the *Journal of Industrial Hygiene & Toxicology*, to which the average physician does not have access.

It has long been held that methyl chloride, methyl bromide, or the iodide compounds of methyl following absorption, break down into methyl alcohol and the

halogen acid. It was believed that the effect upon the central nervous system was due to the methyl alcohol. Recently interest has centered in the so-called "delayed reaction" of methyl bromide wherein a depression of the central nervous system persists after the symptoms of the acute poisoning have subsided. According to Miller and Haggard,[1] methyl bromide is a reactive substance, a portion of which is hydrolyzed in the body, presumably with the formation of sodium bromide and methyl alcohol; both are eliminated slowly and tend to accumulate on frequent repeated exposures. These facts have given rise to the theory that the delayed reaction from methyl bromide might be due to these products, and that there exists severe bromidism complicated with poisoning by methyl alcohol.

Irish, Adams, Spencer and Rose,[2] following their experimentation with animals, concluded that the decomposition products did not account for the delayed reaction but that the central nervous system was affected by the action of the alkyl halide molecules directly upon the tissue. They base their contention upon the low concentration of bromide in the blood. Miller and Haggard object to this viewpoint, stating that the theory of Irish, et al., "would involve damage of the central nervous system of a severe and peculiarly persistent nature from which, nevertheless, there is usually eventual recovery. The symptomatology would seem to suggest more strongly the persistence and only gradual disappearance of some agent causing the functional disturbance. The appearance of marked depression of the nervous system occurring in poisoning by a substance containing bromide, but independent of bromide action, would be a coincidence that would require, for its support, more evidence than that given by Irish, Adams, Spencer and Rowe. Furthermore, injury, such as they suggest, caused by the direct action of the alkyl halide, might reasonably be anticipated from other closely related alkyl halides which do not contain bromide, such as methyl or ethyl chloride. No similar delayed reaction occurs with them; it has, however, been reported for ethyl bromide although ethyl bromide is much less toxic than methyl bromide."

On the contrary, Miller and Haggard believe that the delayed reaction is essentially bromidism but "with the bromide ion exercising its reaction not from the blood, that is, extracellularly, as occurs after ingestion of sodium bromide, but from the interior of the cell where it has penetrated as the alkyl halide and where it has undergone hydrolysis." These investigators state that, "The bromide ion present in the blood stream, as from the administration of sodium bromide, does not, with the exception of the erythrocyte, penetrate the cell membrane in any appreciable quantities but is limited to the extracellular fluid. Alkyl halides, such as methyl bromide, penetrate the cell and dissolve in the intracellular fluid. In this respect, they are entirely analogous to alcohol, and ether for which this penetration has been established experimentally. If methyl bromide which had penetrated the cell was hydrolyzed there, the consequence would be the retention of some bromide within the cell. If the bromide ion trapped in the cell met with as much difficulty in passing out through the cell membrane as the ion, under ordinary conditions, does in passing in, the physiological action might be prolonged. Further, in this unusual position, even small amounts of bromide might exercise a peculiar and especially marked action.

"And finally, the concentration of bromide in the blood resulting from hydrolysis in the extracellular fluid would not then be an indication of the extent or duration of bromide action."

Delay in the Payment of Compensation

IT IS NOT amiss to relate here the unfortunate miscarriage of justice in the Indio episode. Two plants were covered by insurance with two different companies, who promptly paid or are paying compensation. However, the insurance carrier for the plant where the largest number of cases occurred discovered the possibility of dual coverage for its insured and, therefore, refused payment of compensation until the determination of liability is established. One hearing was held in April, 1945, and decision was withheld until a further hearing is held in July, 1945.

In the meantime, the unfortunate victims must suffer economic embarrassment. At such times, the physician thanks God he is not a lawyer for his conscience' sake—if for no other reason. This delay in justice is surely not in keeping with the philosophy of compensation. Certainly the Industrial Accident Commission, having established the occupational cause, could compel payment with the provision that apportionment of the cost be subsequently established. This tirade is indulged in with the hope that it might suggest to organizations of industrial physicians that these bodies use their influence to prevent any similar injustice. It should be made known to legal bodies that there is a humanitarian aspect to medicolegal controversies.

Summary

IN A LARGE group of workers unduly exposed to methyl bromide, the reaction of each was typical to the known symptomatology for this type of intoxication.

2. Although the exposure had existed for an indefinite length of time, the reaction was not immediate but rather "delayed."

3. The theories for this so-called "delayed reaction" have been presented.

4. The cause of this "group poisoning" lies primarily not in the toxicity of methyl bromide but in the *human factor* of ignoring sane preventive measures.

5. It can be expected that with few exceptions, there will exist no permanent disability from methyl bromide poisoning. It is the opinion of the author that of the four patients claiming permanent disability and of the six alleging temporary disability, two claims of permanent disability are due to a neurosis and the others are persisting in their allegations because of the failure to receive compensation.

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Acknowledgement is made to DRS. M. A. LAUTER, CLINTON H. THIENES and HAROLD T. CASTBERG for the data they supplied for this report.

Treatment for Flash Burns

PLANT owners in many fields will be interested in this simple treatment for "flash burns" such as are caused primarily, in shipyards and similar industries, by the ultra-violet light produced when the welder strikes his arc. As reported by K. A. Koerber, in *American Journal of Surgery*, after preliminary treatment in the plant clinic, the patients are given for home use a dropper bottle of "Welder's Drops," compounded as follows: Pontocaine 0.25%; ephedrine sulfate 0.25%; menthol 0.10%; glycerine 5.00%; boric acid solution to make 100.00%. Glycerine is an established ingredient in many standard lotions for treating ocular strains and infections.

—*Glycerine Facts*, May, 1945.

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The Industrial Physician

—and Accident Prevention—

TWENTY years hence industrial accidents will be considered old fashioned. Accidents will be so thoroughly surveyed that their causes and the conditions under which they happen can be largely eliminated." So runs the newspaper account of a prediction by WILLIAM P. YANT, Director of Safety and Research, Mine Safety Appliances Company, at the closing session of the Greater Chicago Safety Conference last month. Everybody in industry will hope he is right. And, from the standpoint of the kind of accidents that the preventive instrumentalities of safety departments will prevent, he may well be right. Safety men, in general, are doing an excellent job. They learn quickly, and profit from experience. But we remember DR. VERNE HARVEY'S summary, in these pages in May: "It has been found that between 80 and 90% of all accidents escape the sphere of prevention which the standard safety program in industry provides. . . . Without denying the utility of the standard safety services in industry as they relate to the 10 or 20% of accidents (adequately provided for) we find an enormous problem based on the human element." The solution of this problem lies in the industrial health program; for, as DR. HARVEY says, the human element "relates to the individual as a whole." In a broad sense, therefore, the *objective* causes and conditions of accidents may be fully controlled, but the *subjective* causes and conditions are as uncontrollable as the vagaries of human nature. How much will these vagaries be changed in 20 years? Some students of history are likely to say not much. But even under the bleak blankets of wars—which are the despair of those who hope for improvement—it will be found that there have been changes, and that these changes were wrought by the same influence that can be used again. We are all too well aware that education for war can make a warlike people. In the reverse direction, education for peace can make a happier world. And, in special application, education for health in industry can make a safer industrial world. Thus the matter of safety reasons around to industrial medicine. Again as DR. HARVEY says: "Industrial physicians can and should fully participate in accident prevention in industry. They can do so with propriety. . . . The question, therefore, is what can the industrial physicians do in the field of accident prevention from the standpoint of the human and environmental factors involved?" In addition to the account of what they have done and are doing as related by DR. HARVEY, there are numerous situations in which medical directors are handling the safety matters of their companies with eminent satisfaction. They have been able without any difficulty to encompass the "sphere of prevention" involving the 10 to 20% of accidents provided for by the standard safety programs. If others can do that, they can do it too. The significance, however, is inherent in the facts (1) that they are securing remarkable results with the 80 to 90% which, as DR. HARVEY says, "escape that sphere," and (2) that they are the ones best fitted, by professional training, to do just that. Among the outstanding examples of *medical* direction embracing both medicine and safety and establishing remarkable records in both are DR. BARR, at National Cash Register, DR. HAZLETT, at Westinghouse, DR. DOBBINS, at Servel, and DR. CLARK, at Norton. There are more; but there should be many more. MR. YANT'S prophecy will approach complete fulfillment as their number increases. Meanwhile the general trend is exceedingly hopeful in the over-all personnel picture. Supervision, which is the only non-medical approach with any chance of much success, is improving all along the line. This implies good induction and adequate orientation; war production history shows that where these were inadequate accidents increased, and that where they were carefully and throughly undertaken there wasn't so much of a problem. It also implies *continued* supervision—plant walks, for example, in which an increasing number of industrial physicians are becoming interested—in expression of that close medical and non-medical cooperation which will, if anything will, reduce the accident problem to its ultimate irreducible minimum.

Escape from Ideology

THE manpower draft didn't pass, and a few weeks later it turned out to have been unnecessary. The nurse draft, until late May still considered vital, has been abandoned; even nurse recruiting is suspended. How many more of the regimentation inspired projects in the legislative hopper will die the same way? We hope all of them. At any rate the turn against impressing everything with ideologies of one kind or another seems to have come before industrial medicine became much affected. This was fortunate, because industrial medicine will not take kindly to ideologies. Its progress heretofore has always developed from within, in spite of the many interferences from without. And its future progress will also derive from within, because in so large measure the same men who made it what it is are still engaged in whatever is necessary to make it what it can become.

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Skin Hazards

—In the Manufacture and Use of Cashew Nut Shell Liquid-Formaldehyde Resins—

LOUIS SCHWARTZ, *Medical Director,* DONALD J. BIRMINGHAM, *P. A. Surgeon,* PAUL C. CAMPBELL, JR., *P. A. Surgeon,* and HOWARD S. MASON, *Chemist, Dermatoses Section, Industrial Hygiene Division, Bureau of State Services, U. S. Public Health Service*

OCCUPATIONAL dermatitis allegedly due to cashew nut shell liquid-formaldehyde resinous varnish has occurred among many workers handling electrical components which had been insulated with this substance. These complaints, coupled with a rapidly increasing range of application for this and similar resins, prompted an investigation of the manufacture and use of these materials to determine their potentials as dermatitis hazards in industry.

The particular plant visited has been handling cashew nut shell liquid for 19 years and is engaged in the manufacture of a variety of resins which include insulating varnish, brake lining dusts, moulding powders and millable rubbery compounds. These materials represent products of cashew nut shell liquid and other chemicals in various stages of polymerization and condensation or "cure."

According to the U. S. Department of Agriculture[1] the cashew nut (*Anacardium occidentale*) is a member of the botanical family of *Anacardiaceae* which includes about 400 species widely disseminated but growing chiefly in warm climate. The cashew nut is a native of Brazil and the West Indies and has been introduced into Asia, Africa and the Far East.

The tree is a spreading evergreen which attains a height of between 30 and 40 feet. The nut, one to one and one-half inches in length, is kidney shaped and is attached to a pear shaped enlargement of the stalk about two to four inches long (Fig. 1). This portion is edible when ripe and is called the "cashew apple." The kernel is contained in a husk consisting of a soft oily grey outer portion and a thin interior membrane. Between these layers is a resinous material which serves as a protection from insects.

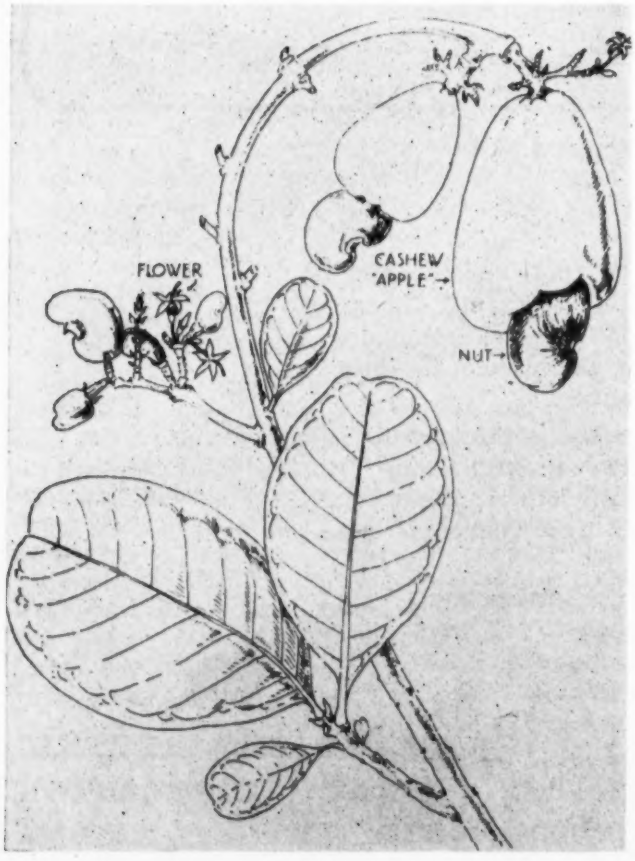


Fig. 1
A fruiting branch of the cashew, showing flower, fruit and leaves. (After Greshoff, M. Kolonial Museum Extra Bul., Afl. 1:5, 1894.)

When the "apple" is ripe the nuts are plucked and dried in the sun. Later, when the nuts are heated, they swell and eject a resinous liquid which is a powerful skin irirtant. This preliminary heating is necessary so that the nut can be broken without damaging the kernel. After the kernels are removed, they are dried, roasted and salted for eating.

The cashew nut shell liquid[2] is obtained either by roasting the shells as is the common practice in India, or by solvent extraction which is said to produce a much greater yield of oil. This oil has been shown to be a mixture of 90% monohydric phenol (anacardic acid) and 10% polyhydric phenol (cardol). The anacardic acid which occurs in the plant becomes changed to anacardol in the manufacturing process by losing carbon dioxide. Anacardol is a monohydric phenol.

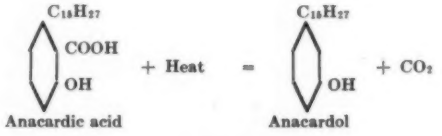


Fig. 2.
Conversion of Anacardic Acid to Anacardol

The cardol fraction is believed to contain the major irritant properties attributed to cashew nut shell liquid and is chemically related to urushiol, the irritant principle of poison ivy.[3]

Cashew bark exudes a gum used as a substitute for gum arabic. It is employed in the manufacture of mucilage and varnish. The juice collected from incisions in the tree trunk turns black upon exposure to air and is used as an indelible marking ink[1] just as the juice of the *Semecarpus anacardium.*[4]

Dermatitis may result from contact with the juice or with materials impregnated with it as a marking ink. Skin irritation may also be caused by the resinous exudate used in mucilage. It is possible that the occasional case of dermatitis attributed to gum arabic is actually caused by this cashew resin.

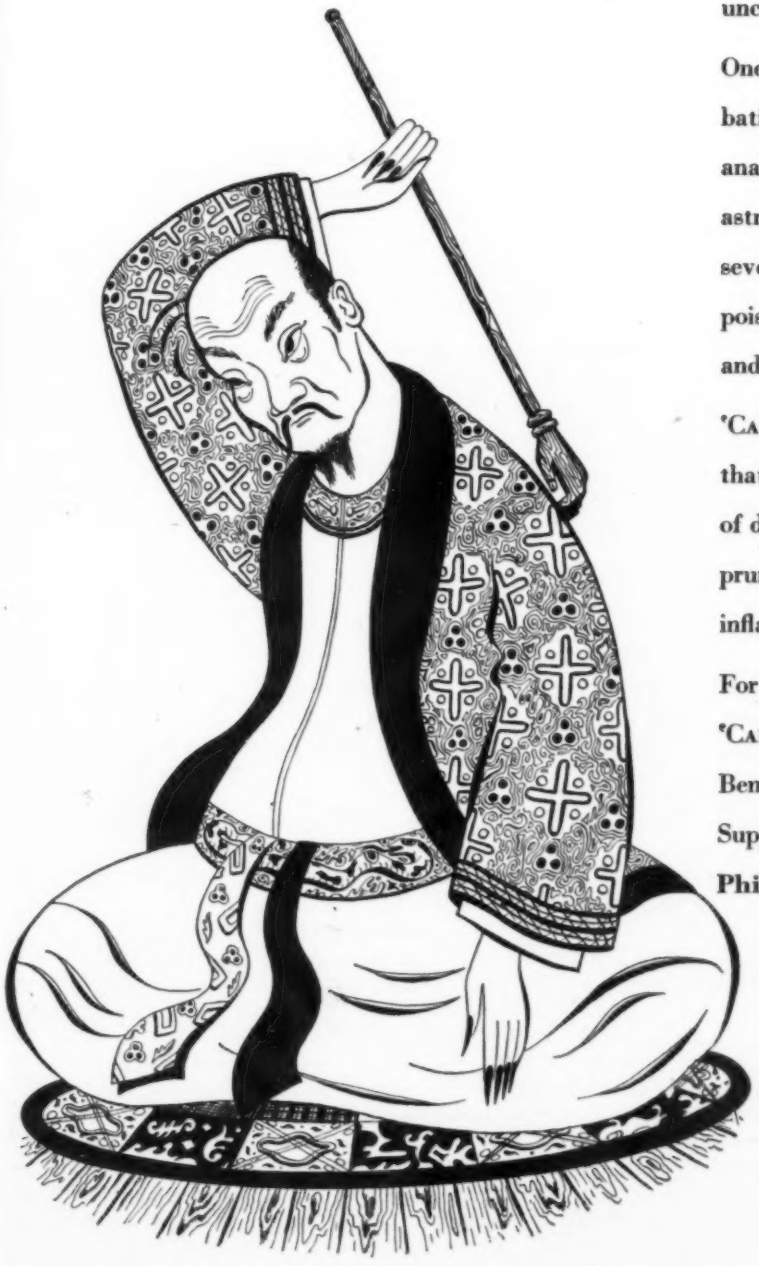
The *Anacardiaceae* are among the principal causes of plant dermatitis. Several interesting relationships in chemical structure of some members of the *Anacardiaceae* are presented in the accompanying chart compiled by Haack.[5]

Occupational dermatitis has occurred in several workers at this plant where cashew nut shell liquid and its products are handled. The greatest incidence has taken place in the warm months among those workers employed in handling liquid and resins which are incompletely cured. It was estimated at the plant that of every 10 new employees who handle the raw cashew nut shell oil, four will develop dermatitis and of these four, one will experience a severe attack, the other three being mild cases.

Actually, only two workmen were handling the raw oil in any appreciable quantity, they being employed at opening and emptying the barrels of raw oil as it came into the plant from India.

One case of dermatitis in a chemist was seen during the tour through the production area and he believed it to be caused by contact with formaldehyde. Several men who had been employed for many years stated that they had experienced "the rash" early in employment but that they eventually became "used" to the materials and no longer developed skin irritation.

the Chinese Back-Scratcher is out of date . . .



Yes, hopelessly out of date . . . because regardless of how popular and self-satisfying the Chinese back-scratcher may be . . . it is no guard against secondary infection which frequently results from uncontrolled scratching.

One of the safest and most effective methods of combating pruritus is the application of 'CALIGESIC' analgesic calamine ointment. Its protective, astringent, anesthetic, analgesic properties relieve the severe itching which accompanies ivy and oak poisoning and insect bites. It does not stain the skin and is safe to use on children.

'CALIGESIC' ointment is a greaseless, bland ointment that affords prompt, welcome relief in the treatment of dermatitis venenata, summer prurigo, pruritus ani, pruritus scroti and other irritations and inflammations of the skin.

For external application only, each 100 Gm. of 'CALIGESIC' ointment contains: Calamine, 8.00 Gm.; Benzocaine, 3.00 Gm.; Hexylated Metacresol, 0.05 Gm. Supplied in 1½ ounce tubes. **Sharp & Dohme, Philadelphia 1, Pa.**

'CALIGESIC'

Analgesic Calamine Ointment

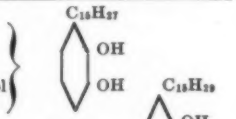
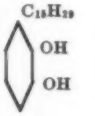
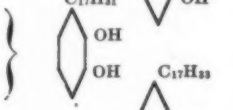
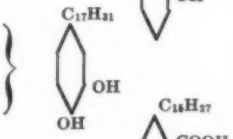
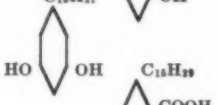
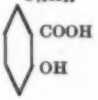
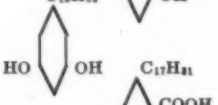
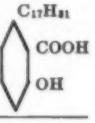
Fifteen employees who had experienced light to heavy exposures to one or more of the varied materials manufactured were patch tested with a representative number of production compounds, the results of which are shown later in this article.

A brief description of the manufacturing process will serve better to clarify to the reader, the raw materials, intermediates and end products which are handled in a resin plant of this nature.

The raw oil in use was prepared in India and delivered to the company in large metal drums which were opened by hand and emptied into a receiving vat. From this vat the oil was pumped into 25,000 gallon storage tanks for use as needed.

From the storage tank area the oil was piped to a 5,000 gallon weigh tank in an adjacent building. The next step in the process placed the oil in an incorporation kettle where it was charged with sulfuric acid and diethyl sulfate under 325° F temperature. The addition of these chemicals under heat is said to cause a mild polymerization resulting in a reduction of the irritant effect of the oil and also the precipitation of calcium potassium and ammonium salts.[2] The removal of the salts by filtrations of the hot oil is said to augment the dielectric properties of the oil.[2]

TABLE I.
THE KNOWN IRRITANT PRINCIPLES OF *Anacardiaceae* AND RELATED PLANTS
(after Haack)

Plant (Bot.)	Common Name	Chief Component	Formula
Rhus vernicifera D. C.	Japanese lac tree	urushiol	
Rhus toxicodendron Linn.	Poison ivy	toxicodendrol	
Semecarpus anacardium	Marking nut	bhilawanol	
Semecarpus heterophylla	Burmese lac	renghol	
Rhus succedanea Linn.	Indo-Chinese lacquer	laccol	
Rhus ambigua Lav.	Tsuta-urushi lacquer	laccol	
Semecarpus vernicifera	Formosa lac tree	laccol	
Gluta renghas linn.	Javanese lac tree	glutarenghal	
Melanorrhea usitata Wall.	Burma lac tree	moreakol	
Melanorrhea laccifera	Thitsi tree	thitsiol	
Anacardium occidentale	Cashew nut tree	anacardic acid	
		cardol	
Ginkgo biloba Linn.[1]	Ginkgo tree	ginkgolic acid	
		bilobol	
Pentaspadon Molleyi Hook.		pelandjanic acid	

1. Does not belong to the *Anacardiaceae*.

At this point in the production cycle the treated cashew nut shell liquid can be treated with a variety of agents to form one or more of several resinous substances. For example, insulating varnish is prepared in the following manner:

A mixture of equal parts of treated cashew nut shell liquid and "cardanol" (the oil distillate of sulfuric acid treated cashew nut shell liquid) is treated with formaldehyde and hexamethylenetetramine. When the reaction is complete filtration yields a dark viscid material which is the insulating varnish.

The varnish is then dissolved in a petroleum solvent and marketed in this form. This material represents a resin which is not completely cured and as such has caused occupational dermatitis. Final cure results when the electrical components such as armatures, transformers, etc. are preheated and dipped into the varnish and solvent, and later baked at high temperatures to become coated with the thermo-setting resin.

Other substances produced by polymerization processes necessitate the addition to the cashew nut shell liquid of chemicals such as para-formaldehyde, phenol, hexamethylenetetramine, furfural, pine oil and diethylsulfate. Each of these chemicals may cause occupational dermatitis if proper precautions to prevent skin contact are not taken.

It is evident that cashew nut shell liquid possesses a great latitude of reaction ability in the manufacture of resins. Polymerization can be stopped at any of several phases as an incompleted polymer or can by chemical and physical reactions become a completed polymer. It was noted with interest in this plant as in other resin manufacturing plants, that the incidence of history of dermatitis among the workmen was inversely proportional to the stage of cure or polymerization of the resin with which the worker came into contact. It seems that the skin irritant properties of the original components diminish as they combine with each other. This fact is in general substantiated by the chart showing the patch test results of test materials which represented cured, partially cured, uncured resins and original components.

Fifteen employees volunteered for patch testing to determine the relative degree of primary irritant or sensitizing qualities of the following substances:

1. Cashew nut shell liquid (treated with H_2SO_4 + diethyl sulfate). Viscid liquid.
2. Anacardol—distillate of above treated cashew nut shell liquid. Viscid liquid.
3. Insulating varnish—an uncured resin liquid.
4. Poison ivy extract 13% solids in acetone liquid (Lederle).
5. Partially polymerized residue of first distillation of treated C.N.S.L. (semi-solid).
6. Polymerized resin of treated cashew nut shell liquid (rubber-like solid).
7. Insulating varnish—cured varnish (solid).

Of the 15 subjects tested, eight were chemists and seven were employed in the manufacturing processes proper such as oil handlers, still operators and maintenance men. All of the subjects tested were more or less in daily contact with one or more of the substances handled in the plant.

Since working in the plant over a period of years, 11 of the 15 had experienced one or more attacks of dermatitis thought to be occupational, whereas the remaining four workmen had never experienced an attack of dermatitis since they had been working in the plant.

RESULTS

On the unprotected hand, the skin lubricant (sebum) was washed away, leaving the skin rough and cracked.

But the hand guarded by TRUSHAY retained much of the natural skin oil and remained soft and smooth!

SERIES OF TESTS

This experiment was repeated many times in a well-known metropolitan hospital, proving that, in most cases, TRUSHAY helps protect hands against the drying effect of harsh cleansers.

TRUSHAY GUARDS HANDS

When hands become dry and scaly, tiny fissures may form which provide easy access for harmful bacteria. *TRUSHAY guards against this by helping to keep skin smooth and unbroken!*

Recommend routine application of TRUSHAY before soap and water tasks . . . before exposure to dirt and grime.

Trushay

THE "BEFOREHAND" LOTION

A Product of BRISTOL-MYERS COMPANY

19NE W. 50TH STREET, NEW YORK 20, N. Y.

Poison ivy was included in the group of patch test materials because of the botanical and chemical relationship of the vesicant principle of *Rhus toxicodendron* to the cashew nut shell liquid and because there has been speculation regarding the cross-sensitizing abilities of these two materials.

All patches were applied to the back in the conventional covered manner with the exception of the poison ivy and anacardol which were applied as open patch tests. Reactions were read when the patches were removed after 24 hours application. Subsequent readings were made 48 hours later. The accompanying chart contains the results of the tests performed in this manner.

TEST MATERIALS	Subjects I		II		III		IV		V		VI		VII		VIII		IX		X		XI		XII		XIII		XIV		XV		No. of Reactions
Hours	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	24	72	
Raw Cashew nut shell oil	+++	+++	++++	++++	+++	+++	++	++	+	++	+++	+	++	+	++	+	++	+	+++	+	+++	+++	+++	+	+	+	+++	+	+	+	15
Anacardol. The distillate of the raw oil. (Liquid)	++	++	+	++	+	+++	−	−	+	++	++	−	+	−	+	+	+	+	++	−	+	−	+	+	+	−	−	−	−	−	12
Insulating Varnish (612c) An uncured resin. (Liquid)	−	−	+	−	+++	+	+++	+++	−	+++	+	−	+++	+	−	+++	+	−	−	−	−	−	−	−	+	−	−	−	−	−	9
Poison Ivy Extract 13% (solids) (Lederle)	+	+++	++	++	+	+++	−	++	−	+	−	+	−	−	−	−	−	−	−	+	−	−	−	−	−	−	−	−	−	−	7
Cardolite resin (633). Residue after distilling the raw oil. (Semi-solid)	+	−	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	2
Cardolite resin (466). A cured rubbery resin	−	++	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	1
Cardolite resin (612) (cured) (solid)	+	+	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−	1

Discussion

A REVIEW of the results of the skin tests conducted upon 15 employees at this plant brings out the following data:

1. Raw cashew nut shell liquid is a primary skin irritant. Most of the 15 subjects tested showed marked reactions at the end of 24 hours and the reactions were still marked at the end of 72 hours.

2. The yield of the first distillate, anacardol (cardanol), represents about 50% of the treated cashew nut shell liquid. This product is less of an irritant than the treated oil, as can be noted in the chart where it is shown that at 24 hours, 12 of the 15 subjects gave positive reactions to anacardol which in general were less severe than the reactions to the cashew nut shell liquid. At 72 hours, five of the 12 reactions had disappeared.

3. Insulating varnish, a partially cured cashew nut shell liquid—anacardol-formaldehyde resin, caused seven positive reactions at 24 hours. At 72 hours, four of the seven reactions had disappeared and in addition, two subjects had developed late reactions. This product therefore, seems to be less of an irritant than anacardol.

4. Of the 15 subjects tested with 13% Lederle extract of poison ivy, which is estimated to contain not more than .2% of the active principle of poison ivy, three subjects gave positive reactions at 24 hours and were still positive at 72 hours. In addition, four more subjects showed positive reactions at 72 hours.

It is significant at this point to mention that of the subjects tested, the only ones who showed a 2+ or more reaction to poison ivy extract were those who had presented a history of having had one or more attacks of poison ivy dermatitis, namely, subjects 1-2-3 and 4. Of interest also is the fact that subjects 1, 2, 3 and 4 showed the greatest number and severity in their reactions to the test materials, all of which are obtained from the family *Anacardiaceae* and which are chemically related.

5. The three Cardolite resins showed the following results: (Cardolite is a trade name and these resins are described below)

(a) (633) Partially resinified residue of distillation of the treated cashew nut shell liquid.

There were two reactions at the end of 24 hours, both of which had disappeared at 72 hours. Subjects 1 and 2 reacted mildly to this polymerized product which is not completely resinified. This shows that much of the skin irritant effect of the original cashew nut shell liquid has been destroyed by heating.

(b) (446) Rubbery Resin. (Treated cashew nut shell liquid + acid + heat.)

There were two reactions to this material which is a high polymer of the cashew nut shell liquid. Subjects 1 and 2 gave reactions at 72 hours and at 24 hours respectively. This again shows that polymerization decreases the irritant properties of cashew nut shell liquid.

(c) (612) Cured Varnish.

There was one reaction to the cured varnish. Subject 1 gave a slight reaction at both 24 and 72 hours. This material is the cured insulating varnish and serves to illustrate the marked difference in skin irritant ability between the cured and the uncured varnish.

Where the results of the first series of tests were reviewed, it was noted that the concentration of the active irritant principle of poison ivy and of anacardol was not the same. Since it was desired to obtain some idea of the relative skin irritant properties of these substances, it was decided to perform a second series of tests with similar concentrations.

With the hope of evaluating or estimating the relationship in sensitivity between anacardol and poison ivy, the following procedure was undertaken.

A pure active principle of poison ivy (hydrourushiol) was dissolved in cyclohexane and made into a 1:50 dilution. (This dilution was estimated as the approximate strength comparable to the 13% Lederle extract of poison ivy.)

Likewise, pure anacardol was dissolved in the same solvent and made into a 1:50 solution.

Gauze patches were then saturated with these materials and allowed to dry. In this manner, the patches had taken up the same amount of solution and when the solvent had evaporated, the patches contained approximately like amounts of anacardol and hydrourushiol.

The patch tests were applied to the left volar forearm. On the right volar forearm, similar patches were

JOHNSON & JOHNSON SUGGESTS:

CONTINUOUS COUNTER-IRRITATION FOR RELIEF OF MYALGIC BACK PAINS

In cases of simple muscle pain, soreness, stiffness or fatigue, Johnson's RED CROSS PLASTERS are a convenient agent for providing counter-irritation. Their primary effect is simple, direct and desirable. The plaster's mild counter-irritant, held on warm flannel, causes local and reflex hyperemia —relieving congestion, easing muscle pain and assisting natural body processes.

Results are immediate and prolonged—one plaster may remain in place for several days, exerting its *continuous* heating, protective and pain-relieving effect. More and more physicians use this tested aid where patients require additional splinting and warming action during post-treatment exposure.

Johnson's **RED CROSS PLASTER**

AND

Johnson's **BACK PLASTER**

applied over a cream designed to protect the skin against tetryl[6] but which differed only from ivy protective cream in that the fatty base was replaced by a shellac base which allowed the cream to dry following application.

The formula of the cream is as follows:

Shellac	13
Isopropanol	31
Linseed oil	4
Titan. oxide	12
Sod. perborate	13
Talcum	20
Carbitol	3

The test results are shown in the accompanying chart (II) where the results of the test materials in the first series are compared with the results of like dilutions of pure anacardol and pure hydrourushiol in the second series.

Subjects	Pure Anacardol 1:50		Commercial Anacardol 1st test		Pure Hydrourushiol 1:50		Poison Ivy Extract 13%	
III	−	+	+	+++	++	+++	+	+++
XII	−	+	+	+	−	+	−	−
V	−	−	+	++	−	++	−	+
VI	−	−	++	−	−	+	−	+
IV	−	−	−	−	−	++	−	++
Hours	24	72	24	72	24	72	24	72

PURE ANACARDOL (1:50):

There were two subjects reacted to this material as compared to four reactions of the same individuals to undiluted commercial anacardol in the first series. Both of the reactions to 1:50 pure anacardol were delayed, whereas the reactions to the commercial undiluted anacardol were not delayed. The pure anacardol (1:50) was obviously not as strong a skin irritant as the undiluted commercial anacardol being handled at this plant. The diluted anacardol used in the second test was estimated to be approximately 1/50 the potency of that used in the first series of tests.

HYDROURUSHIOL (1:50):

All of the five subjects reacted to the test material, one at 24 hours and five at 72 hours. The reactions to the Lederle Extract were approximately the same, showing that the potency of the active principle in both hydrourushiol and poison ivy extract was about equal.

From this experiment it seems fair to state that on a comparative basis the 1:50 dilution of hydrourushiol is a stronger skin irritant than the 1:50 dilution of anacardol. Although both materials are closely related in their chemical structure as shown in Chart I, it will be noted that urushiol is a di-hydric phenol, whereas anacardic acid which loses CO_2 to become anacardol is a monohydric phenol. This may account for the difference in their skin irritating properties.

When the patches of the hydrourushiol and anacardol were applied over the protective cream on the right volar forearm there were no reactions either at 24 or 72 hours. The cream gave protection to the tested individuals against contact.

Conclusions

WORKERS who come in contact with such materials as raw cashew nut shell liquid, anacardol, uncured insulating varnish, and partial polymers of cashew nut shell liquid can and do develop occupational dermatitis.

2. Workers who come in contact with the cured varnish resin should develop very little if any dermatitis from this material, provided the resin is wholly cured.

3. Since cashew nut shell liquid is a phenolic compound, these resins are phenol-formaldehyde resins and workers who handle them should be given the same type of protection as advocated for those working with other phenol-formaldehyde resins, varnishes and glues. These protective measures can be enumerated thus:

(a) Sufficient number of strategically placed washing facilities to enable the workers to quickly remove irritants from the skin.

(b) Daily change of clean protective clothing in the form of impervious gloves, sleeves and aprons.[7] If for any reason the wearing of protective clothing is found to be impossible, a protective cream, the formula of which appears in this article, is recommended for use upon the face, arms and hands.

4. Hyposensitivity or increased tolerance ("hardening") in the ability to contact this type of phenol-formaldehyde resin and not suffer repeated attacks of occupational dermatitis does occur among these workers. The great majority questioned stated that they had suffered from occupational dermatitis early in employment and that after the dermatitis had subsided they were able to resume work without suffering subsequent attacks of occupational skin disease.

5. The incidence of occupational dermatitis in this resin plant is no greater than is found in those plants making other types of phenol-formaldehyde resins.

6. On the basis of the tests performed at this plant we are unable to establish consistent cross-sensitization phenomena between cashew nut shell liquid, anacardol and poison ivy. However, the tests do seem to show at least a remote connection in that the four individuals who proved to be the most highly sensitive to the test materials were those who had a history of one or more attacks of poison ivy dermatitis.

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THIS problem of rehabilitation is not new to industry. The question of the returning disabled veterans is merely going to bring it to the forefront. Owing to the manpower shortage, it was necessary for private industry to resort to the rehabilitated worker. In 1943, the U. S. Office of Education invited a group of employers of these handicapped workers to report on the general efficiency of this group as compared with able-bodied workers. Replies were received from more than 100 employers, most of whom were executives of large corporations. These replies indicated conclusively that the physically impaired workers produced as much as, or possibly a little more than, the able-bodied workers. A more significant fact, however, was that the executives were practically unanimous in reporting that the physically handicapped are dependable, regular in attendance, and careful in observance of safety regulations. The most recent report of the medical division of the U. S. Civil Service Commission corroborates this report, except in accident proneness.

—From the report of the Committee on Industrial Health, West Virginia State Medical Association, *West Virginia Med. J.*, June, 1945.

No. 7 of a series on how vitamins work in industry

'FORTY-FIVE FOOD OUTLOOK

DECREASED SUPPLIES
call for belt-tightening

Civilian food supply for 1945 will be 3% lower than in 1944, predicts the Bureau of Agricultural Economics, following an extensive survey of the national food situation.

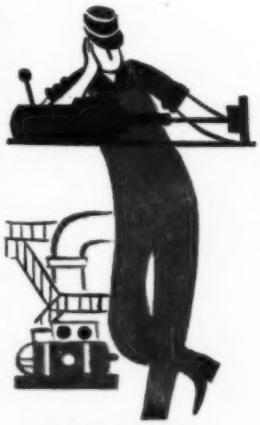
A comparison of this year's estimates with 1944 figures gives the following picture on many items:

	1944 Figures (*per capita*)	1945 Estimates (*per capita*)
Sugar	88.4 lbs.	78.5 lbs.
Meat	147 lbs.	128 to 133 lbs.
Potatoes	132 lbs.	112 lbs.
Butter	11.8 lbs.	10.5 lbs.
Chicken and Turkey	25.5 lbs.	23.5 lbs.
Dairy Products (*average*)	789 lbs.	780 lbs.
Canned Fruit and Vegetables	(Decrease, but definite figures unknown)	

Add to this decrease the fact that military needs continue to drain great quantities of food . . . that lend-lease needs for food remain large . . . that packing and shipping materials grow scarcer, and there seems little possibility of any change for the better for sometime to come.

EFFECT ON YOUR COMPANY

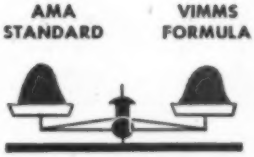
Such impairment of the food situation may very well aggravate the already widespread prevalence of poor diets, recognized by the National Research Council in its now famous Bulletin No. 109: "All the data from numerous surveys, with new methods, among persons of all ages, in many regions, are entirely in accord in showing that deficiency states are rife throughout the nation." Literally millions lack an adequate vitamin-mineral intake. Is it not likely, therefore, that your workers may suffer from the excessive fatigue, lowered resistance to colds, eye-strain, impaired efficiency and lowered morale to which a faulty diet may contribute?



UNDUE FATIGUE
V-M deficiencies
can cause it

VIMMS PLAN POPULAR

To make up the difference between what the average worker gets in his regular diet and what he should receive (NRC Recommended Allowances for Vitamins and Minerals), many progressive industries use the Vimms Industrial Plan. Vimms supply all the vitamins known to be essential in the diet as well as all the minerals commonly lacking.



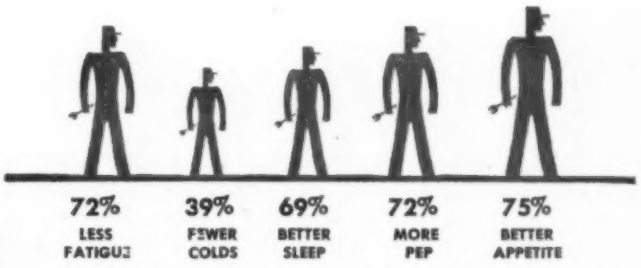
MEDICAL COUNCIL STANDARDS
Vimms meet them

These numerous industries—textile, chemical, machine-tool and others—which utilize the Vimms Industrial Plan find it not only inexpensive but also easily organized.

What's more, these plants conducting the plan report up to 90% of the workers participating in this vitamin-mineral supplementation program.

TYPICAL EMPLOYEE REACTIONS

In a large cotton mill employees taking Vimms regularly returned questionnaires reporting:

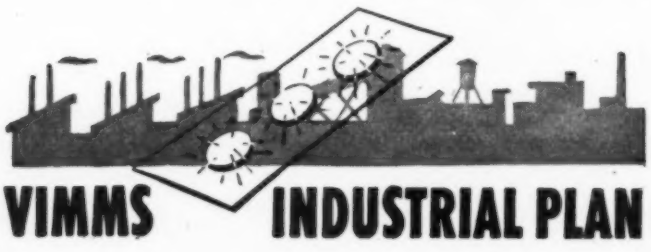


72%	39%	69%	72%	75%
LESS FATIGUE	FEWER COLDS	BETTER SLEEP	MORE PEP	BETTER APPETITE

Equally gratifying are results reported by other companies. Unreported, however, is the fact that the Vimms Industrial Plan also helps to protect office and factory workers against those prolonged nutritional deficiencies which might affect even their later years.

TAILORED TO YOUR OPERATIONS

The Vimms Industrial Plan is carefully worked out by our trained industrial consultants, custom-tailored to your own individual system of operations. Distribution trays, speakers for employees' meetings, posters and payroll stuffers are all part of the service and material provided free with the plan.



VIMMS INDUSTRIAL PLAN

WRITE TODAY FOR FULL DETAILS

Department of Industrial Research
Lever Brothers Company, Box 243-GI
50 Memorial Drive, Cambridge 39, Mass.

Gentlemen: I'd like more information on how the Vimms Industrial Plan can help my workers keep fit.

(Plan limited to Continental United States)

Name_____

Company Public Library Detroit, Michigan

Address_____

Back Saving

—An Outline of Home Care and Personal Conduct—

EDWARD P. HELLER, M.D.,
Kansas City, Missouri

[*Respectfully dedicated to "the man with the hoe" by one with sympathetic understanding who has, with few variations, been telling this story to interested patients for a quarter of a century.*]

IN THIS brief outline it is my purpose to help all I can to make it possible for you to get along with your sore back—either as a constant annoyance of years standing or as an acute temporary condition.

First let us deal with the newly acquired low backache—gotten through work in the garden, a sudden slip on the ice, extra strain in lifting, long standing on concrete, or through any one of a hundred causes. Nearly everyone has had a backache, and only a few are serious or prolonged. Don't be a pessimist. Don't imagine that because the pain is intense and you can scarcely get out of bed that you are "ruined for life" or have a dislocation, a fracture, or a "sub-luxation." You can get gout in your back just as readily as in your big toe! You can have a rheumatic back just as easily as you can have a rheumatic shoulder, a wry neck, or a "Charley horse"—and from identical causes. So don't get impatient and try violent remedies and manipulations.

The right way to lift—by pushing entire body upward with your legs

The WRONG way! All back muscles already on strain

Assuming that you have overtaxed your back by faulty lifting or spading the garden after nine months at a desk job, here are a few directions to follow.

1. Do things gradually—such as walking, arising from chair or bed, or reaching down to tie shoe laces—or avoid them.

2. Take two aspirin or Empirin Compound tablets if you are going to remain at home. If going out, take one of these tablets only, and not oftener than every three hours.

3. Use heat in some form rather than a strong liniment, and massage lower back with a mild analgesic ointment as a lubricant for the skin.

4. Hold the heat by slipping a sheet of wax paper or newspaper a foot square under the band of your shorts, and dress for the season's temperature if you are going out of doors.

5. Avoid all bending forward that you possibly can.

6. Once you have gained an erect posture, try to maintain it—even getting into bed, and out; sitting or standing try to maintain the natural curves of the spine.

7. If you must cough, arch the spine backward. Do not bow it forward as you invariably and naturally would. The same with a sneeze—or even blowing the nose or straining at stool.

8. Place a newspaper or a pillow behind your lower back when you sit down and do not sit partly lying down but erect in a straight back chair.

9. If you have been perspiring, throw a jacket or a newspaper over your back and shoulders and thus cool slowly.

10. If constipated, take a saline laxative each morning a half hour before breakfast for a few days to avoid straining and to thoroughly empty lower bowel.

Sit properly. If still warm from work, slip newspaper or pillow behind back

This posture rests nothing and strains everything

11. If you have a cough, or if you have to clear your throat frequently, get your doctor to prescribe a sedative. The jerk of a cough is enough to reproduce the backache many times each day.

12. If you drink much coffee or tea or coca cola (or any cola drink) or if you are a big meat eater, reduce the irritability of your nerves and muscles by reducing to a low minimum these substances in your diet.

13. Don't imagine that an x-ray will disclose something radically wrong if your backache came on without direct violence to some part of your back or pelvis. Your doctor will want an x-ray if he is in doubt. Ask for one if not a lot better in five to seven days.

14. If you are stockily built and near or beyond 40 you may be rheumatic (arthritic) and the x-ray may or may not reveal the condition (spurs and sharp edges on spinal joints, etc.).

15. If you have a rheumatic back and/or a lot of bad teeth, a pair of chronically infected tonsils or a bad gall-bladder, or if you insist upon overeating and taking more than an occasional alcoholic drink, you are almost certain to hear more from your back. You are a candidate for recurring low backache—even if this is the first backache you have ever had.

16. If you are a frail build you should ask yourself if you are trying, as a race horse, to do the work of a percheron. You might talk to your foreman.

Now let us see what can be done with the back that gets sore after the least use beyond that of sitting and walking. Let us assume that x-ray study has ruled out infected teeth, and that a bad prostate, an infected gall-bladder, weak arches, hemorrhoids, and infected tonsils have been attended to. Let us also assume that your doctor has taken pains to rule out the more serious and unusual spinal conditions and has put you on a stiff mattress. You still may have painful muscular and ligamentous conditions impossible to see on x-ray films. If you have this sort of back, here are a few things that will make it possible for you to live and work with your back—and like it:

1. Learn how to lift (see illustration).

2. Learn how to cough and sneeze—by arching your back.

3. On arising take a hot shower or a hot tub bath first and rub vigorously all stiff joints before trying to shave, before putting on your shoes, or doing any bending exercises.

4. Don't omit your favorite sport, but follow instructions under above about protecting your back, and do what the relief pitcher does—get your reserve muscles warmed up gradually and then keep them warm.

5. Overweight and excess alcohol won't help you a bit.

REMEMBER: (1) That for every displaced or "sub-

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Cough or clear your throat a dozen times in this posture and you'll get a backache to add to your other cold distress

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luxated" vertebra there are a million rheumatic backs, or lumbagos from muscular or ligamentous strain.

2. That poisons from an undiscovered source may still be the cause of backache—may finally be found and eliminated.

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4. That even with "15 miles of kidney tubules"—and with all tubules plugged, not a single such tubule-mile (or a hundred miles) ever produces the kind of backache you and I see in industry, on the golf course or in the victory garden!

Increasing Importance of Industrial Health in Industrial Relations

V. P. AHEARN,
Industry Member, National War Labor Board;
Executive Secretary, National Sand Association

THIS question of industrial health has already gained the status of a major problem, and one we have seen only in its expression stage, and by no means have we seen either the demand or the things that are going to be done to achieve that objective. There is hardly a major case coming before the War Labor Board which does not involve, at one stage or another, a demand that something shall be done, even to an order by the Federal government to improve health. Even though the demand may not meet the objective, even though it may be unworkable, none the less the reality of that demand is something that practical men in industry will not ignore.

Physical examinations come to the fore. That is unavoidable. In the non-ferrous industry, the Non-Ferrous Commission, which is an agency of the Board, issued an order requiring that applicants for work undergo a physical examination; that x-rays be taken, but that results of the examination by the company's physician, including x-ray plates, be made available, not only to the company, but to the worker as well. When it got to the War Labor Board there was a great deal of discussion. The Public Members of the Board liked the idea; thought a worker was entitled to be told what his medical examination had disclosed. But because the Board was disturbed about the possibility of invading certain sacred grounds of the medical profession, the Non-Ferrous Commission order was reversed.

Sick Leave Plans

INDUSTRIAL health has come up in the current steel cases and in the current General Motors case, which are two of the approximately six major cases now before the Board and which will soon be disposed of. There the issue has been raised as to sick-leave. The unions in both cases have proposed elaborate sick-leave plans. I know that you can prove, perhaps by statistical analysis, even by medical and engineering testimony, that sick-leave plans just won't work. I have no idea what the Board will do with reference to the plans presented in these cases, but I recognize the strong emotional appeal which a sick-leave plan has, and I call attention to it only as a part of the increasing importance which industrial health has with industrial relations.

We had another interesting case involving the fur workers of New York City. There the fur industry and the fur industry union had a dispute, even though the parties have a background of 32 years of industry-wide collective bargaining. The panel which heard that case seemed to be very sympathetic with a statement of the union that the New York workmen's compensation law afforded inadequate coverage for certain occupational hazards in the fur industry and at one stage proposed that the War Labor Board cure these deficiencies in the New York statutes! That will give an example. However, there is here an emotional appeal based on something very real in the minds of the workers.

Another subject I hear a great deal about is group insurance. That is the issue in the steel case at the present time. I have no idea what the Board will do with that. It has worked out in many industries. The Board, so far as I know, has never ordered group insurance or sick-leave plans.

Union Proposals

MOST of you may have seen a CIO proposal on matters of this sort, and particularly the issue raised in the non-ferrous industry about disposition of information from x-rays and physical examinations. One of these proposals is that each employee shall be furnished with a copy of each physician's report and laboratory reports made by the company or by its insurance company. Passing a physical examination shall not be a condition of re-employment or continuing employment except in the case of an active, continuing disease. No person shall be denied employment having a hernia, arrested tuberculosis or other non-disabling, non-communicable disease. It is further proposed that, if an employee is denied work, such denials shall be referred through the regular grievance procedure. That means that unions are going to try to have much more to say about sick-leave and physical examinations, both pre-employment and periodic.

The AFL has not been quite so active in this field as the CIO, but, none the less, there is a strong feeling in the AFL that physical examinations have been used, not for the purpose of screening off workers who are unfit for the hazard of the job, but for a purpose wholly unrelated to physical examinations. I don't think the AFL is quite so interested in group insurance as the CIO seems to be. I don't know whether they will make too much of the issue of sick-leave plans, but nevertheless the strength of feeling in the whole rank and file of labor on all these things is something that should not be dismissed lightly. I heard the discussion here about pre-employment examinations but very little about periodic examinations, which are in most cases more important. It has been said from this platform before that physical examinations are not a subject for the doctors alone. It is only a part of the job so far as physicians go. It is an engineering problem, a management problem; it is a human problem.

Viewing Labor's Position

I WONDER what we would say, trying to get a realistic view of labor's position, if it were proposed, for instance, that men in our walk of life should have to stand not only a pre-employment but also a periodic physical examination, conducted by a physician not of our own choosing, the results of whose examinations would not be made available to us, but whose decision might mean the difference between a job and no job. I wonder what our individual reactions would be to any such proposal, particularly if the company physician was young and inexperienced—if he should be, in our eyes, an incompetent man to make such a serious and solemn decision. Then we say, as you and I and, perhaps, others, have said, "After all, the only thing we are trying to do with physical examinations, old fellow, is to keep you from getting killed or dying." Maybe it is so. Suppose you have worked for an industry for five years and it is the rule that you must stand a periodic physical examination; you are at a job paying a dollar and a quarter an hour, which carries with it an occupational hazard or else this periodic examination would not be made, and the result, in the manner that I have just described, is that you are told that it is unsafe for you to continue to be exposed to that occupational hazard. Well, that sounds as if the fellow is really being snatched from the jaws of death; but he's transferred to another job, and the only job in the plant is a job paying 75 cents an hour. Now the worker has adjusted himself to a dollar and a quarter an hour. His budget calls for that kind of income. Just how reasonable is it to tell him under these circumstances that we are saving his life and cutting down his income? I only ask the question—I don't know the answer.

From the proceedings of the Ninth Annual Meeting of Industrial Hygiene Foundation of America, Pittsburgh, November 15-16, 1944; published by the Foundation Transactions Series, Bulletin No. 4, April, 1945.

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I have spoken about the fear of the workman concerning the inexperienced company physician. That is also expressed in this CIO proposal. You find it in paragraph eight. "First aid men and nurses shall not remove foreign bodies from eyes, give medical treatment or prescribe treatment." That wasn't drawn out of the thin air. Undoubtedly there have been cases where first aid men and nurses have given medical treatment which proved disastrous to the worker. That is something else you are going to hear about as time passes.

Employment of the Disabled

INDUSTRY has a splendid opportunity as this war approaches an end to show what can be done to give employment to workers who at one time were regarded as disabled and therefore not able to qualify for a job. We have found out during this war that blind people, for instance, can do work of a very skilled character which people with normal vision cannot do nearly as well. We found people who were regarded as too crippled to do heavy physical work. We used them, and these people have made a magnificent contribution to production for war. Think how much more dramatic that problem is going to be after the war. Many are going to be disabled and if industry, if insurance companies, stand on a letter of the Selective Service Act, then trouble is going to follow.

Perhaps one of the unfortunate results of workmen's compensation insurance legislation is to force perfection—physical perfection, where physical perfection just does not exist. So insurance companies and industry together have the job of providing useful employment for all workers, even though there may be cases, as there undoubtedly will be, where, under normal circumstances, you would say that physical disablement is so far advanced that our insurance company, and we, feel they would be a dangerous risk. We must not expose this fellow to the hazard of this job. Where is he going to find work?

Unions haven't been without their dereliction in this regard either. That is particularly true with unions that have begun to accumulate large sums of money in their treasuries. I served on a committee of the War Labor Board and sitting as a member was a doctor from a very prominent CIO union. There was a talk on industry's use of physical examinations. The doctor said that the question of physical examination should be turned over to the unions entirely, that the union should be the judge of whether a man was physically able to work. It happens that this union has a very elaborate insurance, pension, retirement and hospitalization plan. It has accumulated a substantial sum of money. No man or woman can go to work unless the union advises the industry that the applicant is worthy of the job in a physical sense. This union has screened out every worker who does not meet the kind of physical test that will preserve the integrity of its insurance fund. I have even heard that it is getting so conservative with its funds that it refused to finance a strike—it was too expensive!

The physical examination is very real in the life of the worker who faces these examinations, pre-employment and periodic, and we must not consider it as just another point for union agitation. We must come to grips with it. It is a job that requires men of good will on both sides of the table. Once we recognize the existence of the problem, I am confident that industry can at least approach a solution of it.

A Check List on Working Conditions

I HAVE MADE notes on some things which are not too important perhaps, but I wonder if it wouldn't be well for all employers to do a little introspective examination about them from time to time. These I have gleaned from work on the War Labor Board and also from my work in the industry with which I am associated—little things in many cases, but they have become major issues in other cases.

Ventilation. This seems like a rather small thing to a great many people, but I am confident that, at the working level, the lack of adequate ventilation has done as much to contribute to poor labor relations as anything.

Illumination. Men have to stumble around in poorly

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lighted buildings because the small problem of illumination has not been recognized and solved with the aid of the great industry that provides illumination.

Toilet Facilities and Showers. I have seen places, and I am confident that every man in this room has also, where no man should be asked to work; toilet facilities indescribably dirty and shower facilities in name only.

Protective Clothing and Protective Equipment. I once heard a worker say the dirtiest place in a foundry was the first aid box.

In-Plant Eating. That is a new thing in name only. It won't work in some cases, but it is working in many cases where they said it wouldn't work before. I think it is something that needs examination.

Isolation of Dangerous Processes. Simple engineering techniques are all that are required in many cases.

Last, but not least, there is *the question of hospitalization.* I think this affords opportunities for industry to establish that good will and morale which are necessary for the kind of postwar world we are all hoping to see.

It is my fervent belief that the dignity of every individual has to be realized by those who have often neglected to see its importance, and by managers, who, on occasion, have been equally derelict. I saw that in a recent issue involving vacation. The claim was that the worker was not given enough notice of his vacation. He wanted more notice. It seemed to me he was entitled to it. A man's position with his family is involved. He goes home and says, "My vacation starts tomorrow." It seems to me he loses face and prestige in his own home where he must preserve his dignity. A man wants to say, "The question of my vacation is a matter of discussion. They have given me two months' notice." In this way, the family can take that trip to the mountains; get ready for it; go over the maps. Contribution to the dignity of that individual is well worth while.

We on the management side have got to look it squarely in the face—a change has taken place—a very real change. I wonder if any of you have read the book called "Inheritance" by Phyllis Bentley. It deals with England, about 1820. It traces the history of a family. At that state of its existence, the family had a "Communist." What was he agitating? For a law limiting the employment of children to 12 hours per day—a law requiring the employer to give his children Christian education on Sunday! As Durant said, "Custom lends propriety and time lends sanctity."

Again, running through all this is the worker's fear of insecurity; the fact that he may lose his job overnight. Men spend right up to their budget or income. That is why we hear so much about sick-leave, group insurance, dismissal pay and guarantee pay. I have heard Bob Watt of the AFL say from this platform that a man's fear of insecurity, his desire to maintain and hold onto his job, will cause him to work at the job regardless of the occupational hazard until he drops in his tracks. We have to show him that the private enterprise system, in which I have so much faith, is a better system than any other. What did Hitler offer his people? Jobs for everybody, and he gave all of them jobs. We found out there is more than social security. Personal security and political security are indeed securities well worth while. We have to be sure that this "jobs for all" slogan isn't picked up by an American demagogue, because back of it lies undoubtedly the intention to change not only our economic system but our political system as well. But industry in this country has behind it a record—once it sees something, once it grasps the reality of a specific fact, it will meet and overcome the problem.

Up to Management

IT SEEMS to me that the Industrial Hygiene Foundation has shown the realism of that approach. So far, I have heard very little pontificating from this platform. This is the problem. One hundred years from now, it will still be a problem, but we are not going to sweep it aside; we're going to do it. If we don't, unions will solve it for us, and I am afraid that their solution won't be as good as management's solution, if it really goes to work.

This really isn't within the title of my talk, but let me

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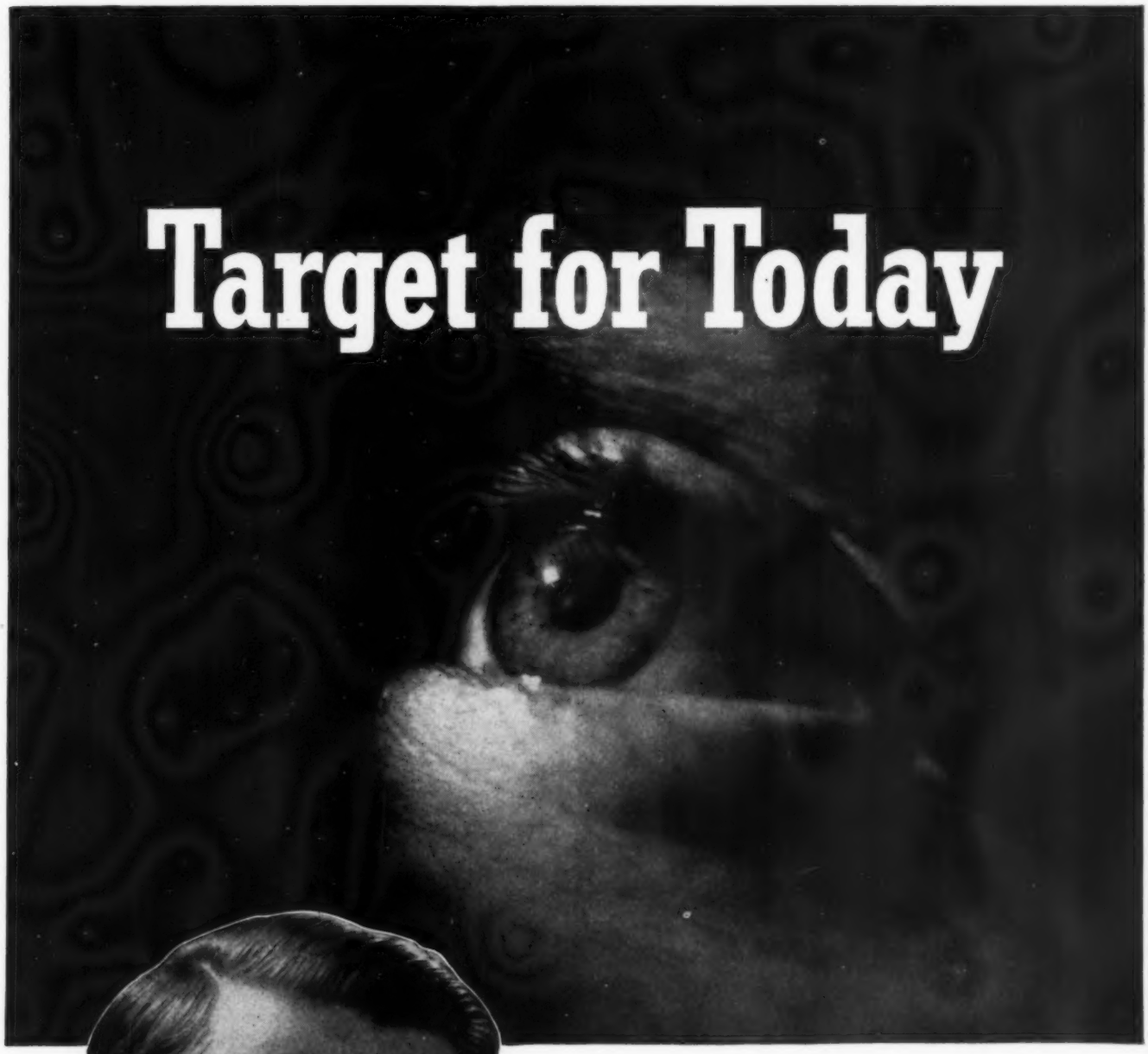

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say just one word about unions, as an individual. I do not represent any one when I say that I am not one of those who believes that the veterans are going to be anti-union. I know they are irritated with strikes. A man fighting for his life in the Philippines can't understand why supervisors at an aeronautical plant called a strike. He resents it and, if he could, he would do something about it. But I think, on the whole, looking at it in total perspective, the unions have done a swell job of honoring the no-strike pledge. I know you can say, "look at this case, look at that case." What was it that Stalin toasted at Teheran? It was American production, and that has won this war for the Allies. We have our system to compare with their systems. In Germany, there weren't any strikes; in Italy, there weren't any; and, I understand, there haven't been any in Japan, but we're beating the hell out of those countries! And I was under the impression that one of the reasons we had war was because their system threatened ours. The integral part of their system is no-strike pledge—or no pledge.

Being from Washington, I would like to say as a final chapter that I have great faith—unlimited faith—in the ability of employers, management, private industry to do the great job that lies ahead of us. Certainly this fine system that we have, which has produced more employment, more real wealth, than many have ever thought of, is well worth fighting for. We must do this job. I am convinced that in the political and economic system which we prefer above their systems, there is the necessary link with the private enterprise system.

Quinine in the Treatment of Respiratory Tract Infections

HENRY M. FEINBLATT, M.D., F.A.C.P.,
Brooklyn, New York

WITH the steadily increasing advances of American armed might in the Pacific, it is hoped that Java, the world's chief source of cinchona, will soon be wrested from Japanese control, thereby releasing its precious stores of quinine in ample quantities for use by physicians everywhere.

In light of our experience in the last World War and the influenza epidemic of 1918 and 1919 with its malignant character, it behooves us in retrospect to consider carefully and to be prepared to make the best use of any of the agents that offer promise in the prevention or amelioration of the disease. During the epidemic of the last war, I was most impressed by the efficacy of quinine as both a protective and therapeutic agent.

The outstanding value of quinine in the treatment of malaria calls for little comment. It has been appraised in a report of the League of Nations Malarial Commission (1937) which summarizes its report thus: "Among these drugs *quinine* still ranks first in general practice, by reason of its clinical effectiveness and almost complete absence of toxicity, coupled with widespread knowledge of its use and dosage."

This value has been recognized by our government which, notwithstanding the availability of synthetic substitutes, urges physicians everywhere to restrict the wartime use of quinine to malaria. It is common knowledge that the unavailability of an effective antimalarial remedy was a serious handicap in maintaining the health and fighting ability at Bataan, in the Philippines and elsewhere in the Pacific area. Thus the fact is inescapable that our government acted wisely, despite criticism, to safeguard our quinine supplies so that the Armed Forces may have as large an amount of this drug as possible.

Much literature has been accumulated concerning the etiology, prophylaxis and therapy of the common cold, influenza or grippe, so-called, and the newer dis-

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ease entity, virus pneumonia. In regard to these affections many theories have been advanced. With usage some of these theories have been shown to have a practical value, while others were dropped because they did not fulfill their theoretical promise.

From the vantage point of many years of experience, I am convinced that in these common respiratory infections, which so often incapacitate large numbers of our population, there is a tendency among us to fail to take advantage of a useful agent. Quinine has proved of decided value in the treatment of common colds, influenza and virus pneumonia. In these conditions it is my belief that quinine exerts in some degree an antagonistic action against the causative organism. It is well known that quinine acts as an antipyretic and an analgesic. Many believe that it also reduces the duration of the illness, decreases the incidence of complications and may even abort the illness if given before the infection has become firmly established.

Colds and Influenza

IT SEEMS convenient to discuss colds and influenza together, since in making the diagnosis it is often difficult to differentiate between them. Cecil[1] writes: "It is difficult to draw a sharp line between the common cold and 'grippe'. . . By grippe, however, doctors and laymen both think of a cold with definite constitutional symptoms such as fever, malaise and headache. Influenza represents the third degree of severity and may be defined as an acute catarrhal infection of the upper respiratory tract accompanied by chilly sensations, fever which is sometimes quite high, extreme prostration and leukopenia."

For many years a popular treatment for a cold, in the hands of the laity, was a dose of quinine and a hot whiskey or rum drink. Johannessohn,[2] a Russian immigrant apothecary, reported that during the Turko-Russian war (1878-1879) fairly large doses of quinine sulphate in alcohol were administered with much success. During the 1889-1892 influenza epidemic and again in 1918 quinine was very generally employed as a most helpful drug.

Textbooks on pharmacology and therapeutics mention that quinine is useful in the treatment of colds and influenza. For example, Sollmann[3] states that, like other antipyretics, quinine has an analgesic effect in these conditions. He recommends doses of from 1 to 5 grains and says that in colds small doses suffice.

Some of these authorities recommend the administration of quinine as a prophylactic. Solis-Cohen and Githens[4] state that "quinine is useful in coryza, especially in the incipient stage when it may abort the attack or at all events shorten the course and mitigate its severity." During the 1918-1919 influenza pandemic many hospitals in southern Europe reported on the infrequency of influenza occurring in malarial patients who had been treated with quinine (U. S. Dispensatory[5]). During a severe outbreak of influenza in a prison camp in 1918, Laubenheimer[6] observed that there was a high percentage of protection in those treated with quinine as against a control group who were untreated. Vielchenblau[7] declared that "quinine is the only drug in which a 'specific action' (against influenza) can be perceived." My clinical observations would tend to support such findings.

More recently several American writers have called attention to the prophylactic value of quinine in influenza. Showalter[8] reported a low incidence in the 1918 epidemic in his group of cases treated with quinine. He noted further that the number of leukocytes, which is reduced in influenza, was increased after quinine was administered. He believed that the increase in

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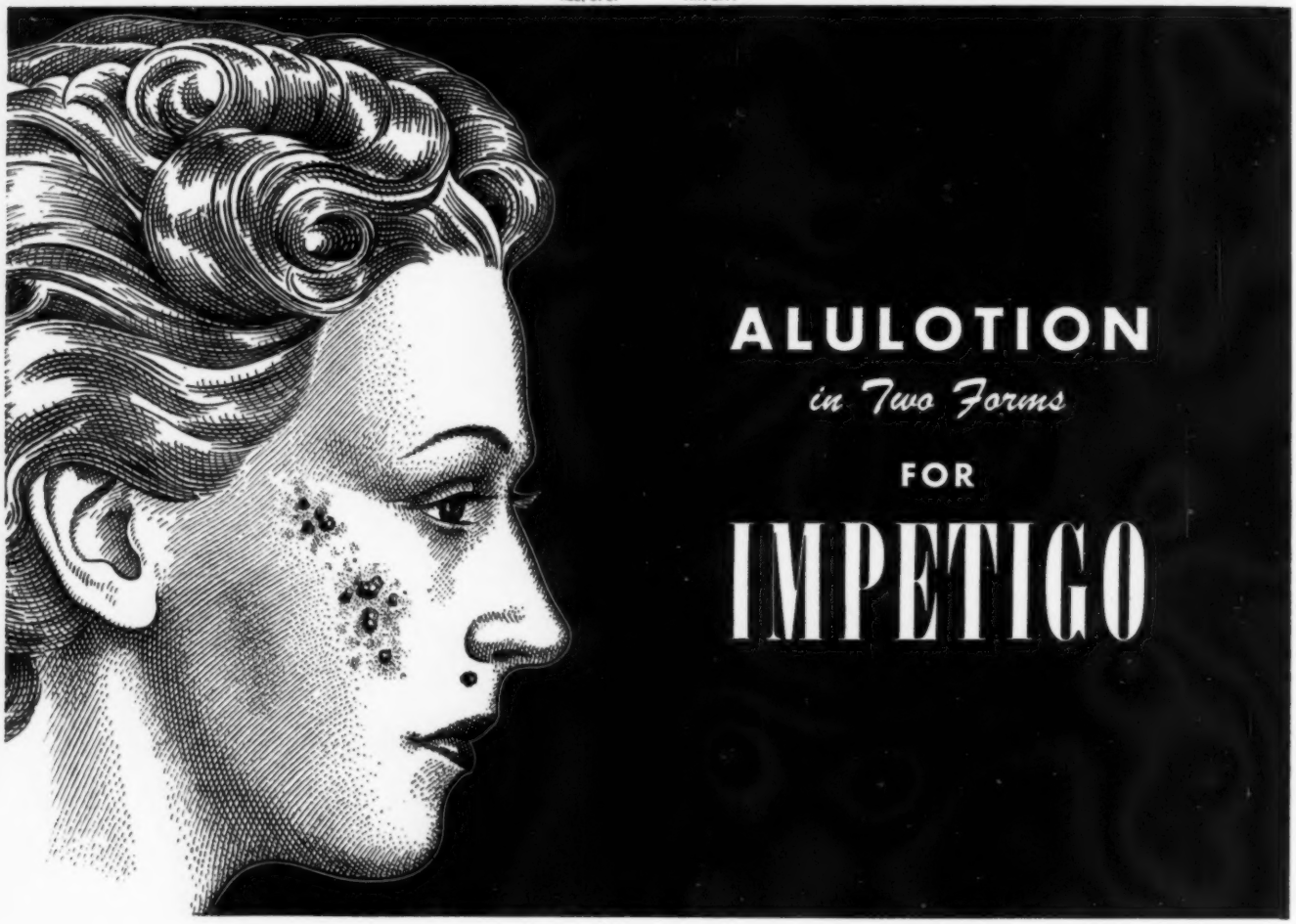

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white blood cells following quinine might be an important factor in explaining the favorably clinical results of quinine therapy in such infections.

Barge[9] observed similar correlation between the leukocyte rise and the protective effects of quinine.

Schnurman[10] observed in a war plant employing 13,000 people that of the group of 6500 given quinine during an influenza epidemic in 1941, the incidence was only one-fourth as many cases as in the control group of 6500 who received no medication.

The etiology of the common cold has long been a research problem as well as a controversial issue. On the basis of animal experimentation, it is now generally conceded that common colds are caused by a virus.

Smith, Andrewes and Laidlaw[11] in 1933 succeeded in isolating a filtrable virus from patients with influenza by inoculating ferrets intranasally with filtrates of throat washings from these patients. In a comprehensive monograph on the etiology of influenza, Shope[12] in 1944 advanced the opinion, supported by evidence from the literature, that the pandemic virus of influenza has a specific avidity for Pfeiffer's bacillus and with it constitutes the infectious unit.

Scattered epidemics of influenza occurred in various sections of the United States in 1940 and 1941. Epidemiologists have expressed the opinion that, with the large concentrations of men in camps and factories, the stage is set for a more severe and widespread epidemic in 1945. Should this occur, any measure that would decrease the incidence and severity of the disease would be of vital importance to all physicians.

A point having a bearing on the prophylactic use of quinine is its value as a tonic in raising resistance to respiratory tract infection. It is common knowledge that quinine is a prominent ingredient in many general tonics. The tenth edition of the United States Pharmacopoeia listed both the antimalarial and the tonic doses of the drug, recognizing its value as a tonic in a dose of 1½ grains. It is, therefore, logical to assume that, if the general systemic resistance is raised, the resistance to upper respiratory tract infections is also enhanced.

Atypical Pneumonia

SINCE Longcope[13] wrote his classic on "atypical pneumonia," now usually termed "virus pneumonia," a voluminous literature on this subject has appeared. Longcope believes that, because of certain distinctive features of the disease, the causative agent might well be a filtrable virus. These features are its contagiousness, long incubation period (from 10 to 14 days), the inability to demonstrate by culture of the sputum or of the blood or by agglutination reactions that it is associated with any known pathogenic bacteria, and the peculiarity of the pathological changes found in the lungs.

The efforts of investigators in this country to isolate a virus from the throat washings of typical cases of this type of pneumonia in a wide variety of animals failed. Then, in 1940, Weir and Horsfall[14] went to Jamaica with the idea of trying to infect the mongoose. They succeeded in isolating a virus which produced pulmonary consolidation in these animals. It was unlike any other virus known to produce respiratory tract infection in man. Since it is illegal to import the mongoose in the United States, it has been impossible for research workers to confirm these findings.

Within the past five years a considerable number of cases of non-specific pneumonia have come under my observation. Clinically, these very closely resembled reported cases of primary atypical pneumonia or virus pneumonia. In the treatment of both ambulant and hospital patients the symptomatic improve-

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*"Bactericidal Efficiency of Iodine Solutions and Organic Mercurial Antiseptics", Amer. Jour. Pharm., 117:5 (Jan.) 1945.

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ment and the rapidity of recovery were more satisfactory in quinine-treated patients than in those who did not receive the drug. It has been my routine to administer from 6 to 10 grains of quinine daily in those cases. In no instance was any toxic effect observed. No evidence of renal damage or of degenerative changes in the blood occurred in any case.

Sulfa Drugs

INASMUCH as sulfa drugs have proved to be practically specific in pneumococcus pneumonia, it seemed logical to try them in virus pneumonia. In fact, it was the failure of the sulfa drugs to produce their customary reaction in many cases that suggested a search for more accurate diagnosis. Repeated reports stating that sulfa drugs have no effect on the course of primary atypical pneumonia are found throughout the literature and would seem to require no elaboration. As Reimann[15] concluded: "The sulfonamide compounds have not yet been shown to have any influence on influenza or other influenza-like pulmonary infections which have been prevalent in recent years, nor are they of value in pulmonary congestion or in mixed infections of the lungs where bacteria susceptible to the sulfonamide compounds are not present."

In view of the favorable effects from the use of quinine in these various virus pulmonary diseases, it is hoped that further investigations will lead to more fruitful and conclusive contributions to this group of patients when quinine is again available.

Summary

A REVIEW of the literature over the last 50 years indicates the value of quinine as an important agent in the prophylaxis and treatment of colds and influenza. Its antipyretic and analgesic action are well known. In virus pneumonia, my patients have responded more favorably to quinine than to any other medication. While its mode of action has not been satisfactorily explained, its empirical value is definite.

In view of the dangers of epidemics of virus pneumonia and influenza, it is well to take this occasion, when so much attention is focused on the sulfa drugs and penicillin, to remind the profession that these newer medications are not panaceas and that a useful, active agent such as quinine could be widely used with great benefit.

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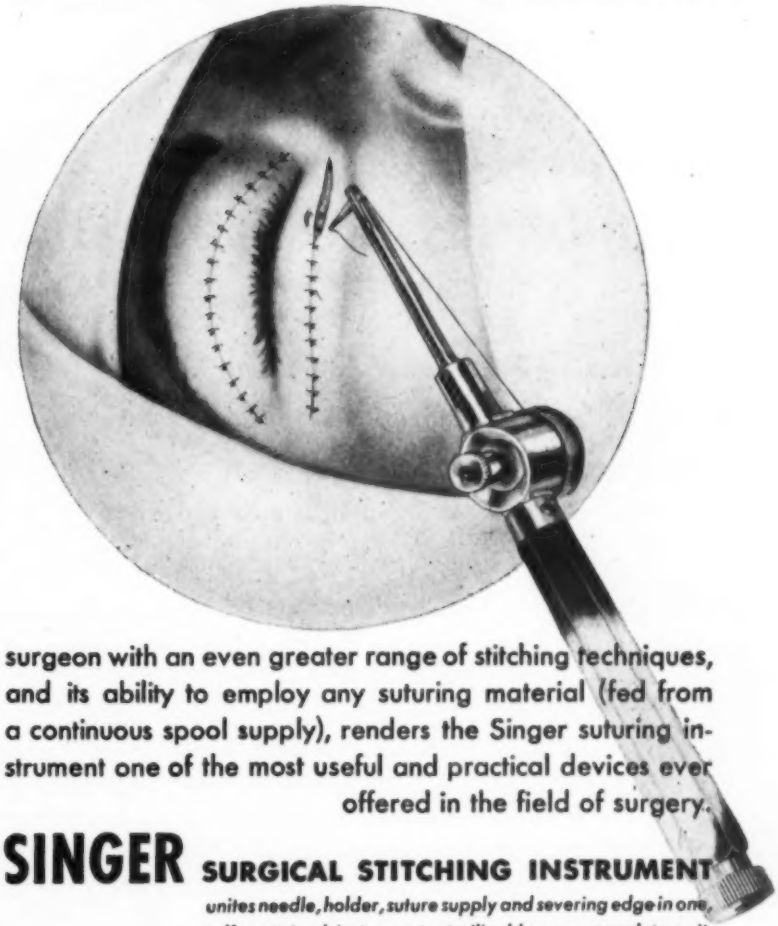

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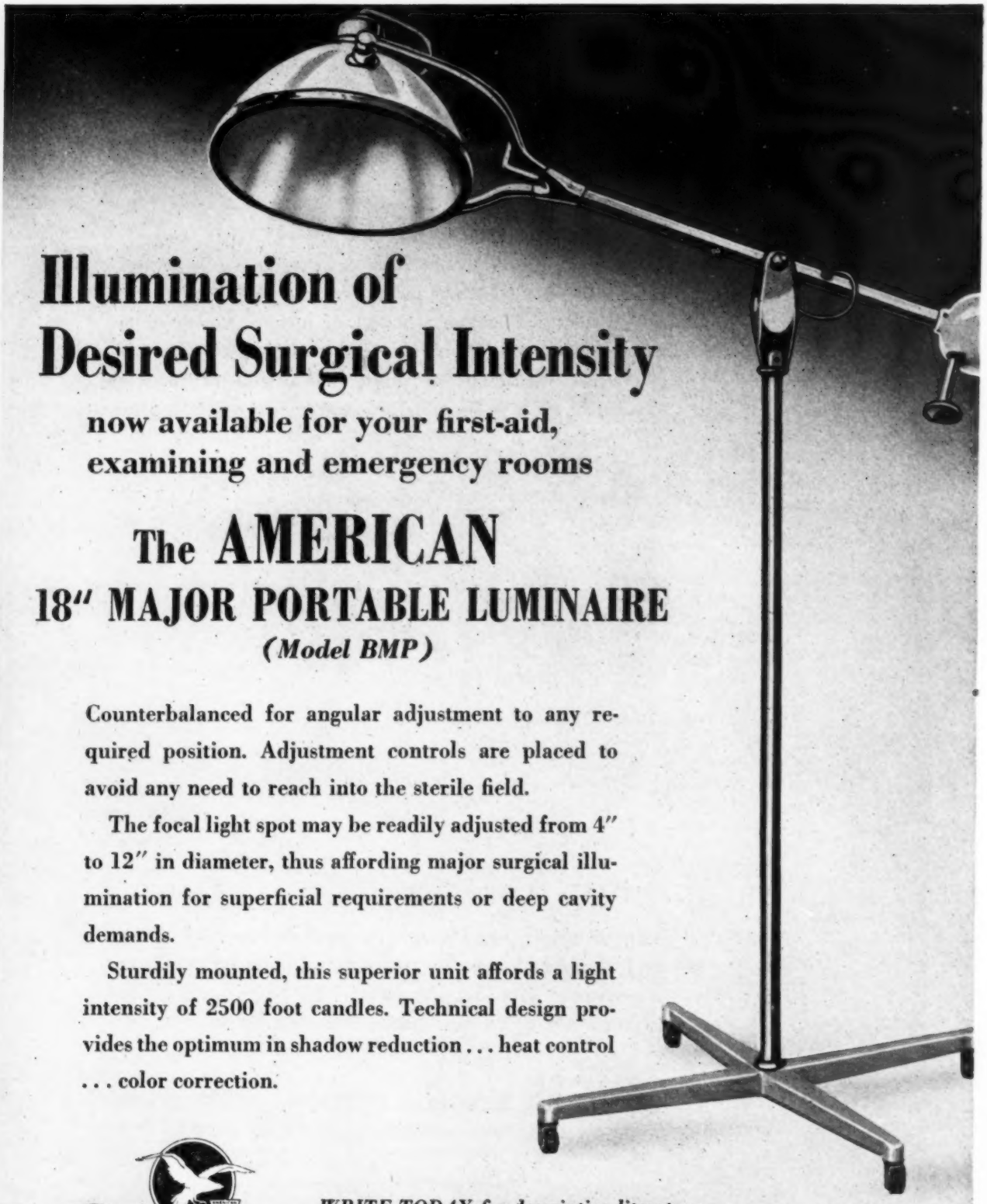

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"When Polio Strikes"

ON THE EVE of infantile paralysis summer outbreaks, a recapitulation of the figures available shows that the number of poliomyelitis cases in the country is running about 50% ahead of a year ago, according to Dr. Don W. Gudakunst, Medical Director of The National Foundation for Infantile Paralysis. As of mid-May, the new cases this year were 642 as compared with 424 cases for the same period in 1944. Sharp increases have been reported in the New England states, Middle Atlantic states, South Atlantic area, and the East South Central states. In the Pacific Coast and West South Central areas which have been hard hit during the past two years, there has been a noticeable drop in the number of new cases. The remainder of the country is running about the same as last year.

As June through September is the season when infantile paralysis generally is on the upswing in the United States, the National Foundation for Infantile Paralysis has compiled the following suggestions which will be helpful. The title is "When Polio Strikes . . . Helpful Hints for Everyone."

DURING an outbreak of infantile paralysis be alert to any early signs of illness or changes in normal state of health, especially in children. Do not assume that a stomach upset with vomiting, constipation, diarrhea, severe headache or signs of a cold and fever are of no importance. They may be among the first symptoms of infantile paralysis. All children and adults sick with unexplained fever should be put to bed and isolated pending medical diagnosis.

2. Don't delay calling a physician. Expert medical care given early may prevent many of the crippling deformities. Proper care from the onset may mean the difference between a life of crippling and good recovery.

3. Today there is no known prevention or protection against infantile paralysis. All that can be done is to provide the best possible care. Your doctor, your health officer and your local Chapter of the National Foundation for Infantile Paralysis can and will do everything in their power to see to it that your community is ready to meet an epidemic.

4. Observe these simple precautions:

(a) Avoid overtiring and extreme fatigue from strenuous exercise.

(b) Avoid sudden chilling such as would come from a plunge into extremely cold water on a very hot day.

(c) Pay careful attention to personal cleanliness, such as thorough hand washing before eating. Hygienic habits should always be observed.

(d) If possible avoid tonsil and adenoid operations during epidemics. Careful study has shown that such operations, when done during an epidemic, tend to increase the danger of contracting infantile paralysis in its most serious form.

(e) Use the purest milk and water you can. Keep flies away from food. While the exact means of spread of the disease are not known, contaminated water and milk are always dangerous and flies have repeatedly been shown to carry the infantile paralysis virus.

(f) Do not swim in polluted water.

(g) Maintain community sanitation at a high level at all times.

(h) Avoid all unnecessary contact with persons with any illness suspicious of infantile paralysis.

5. Don't become hysterical if cases do occur in your neighborhood. While infantile paralysis is communicable or catching during any outbreak, there are many who have such a slight infection that there are few or no symptoms. This large number of unrecognized infections is one of the reasons there is no practical way of preventing the spread of the disease. But it is also reassuring to know that, of the many persons who become infected, few develop serious illness and that, with good care, the majority who are stricken will make a satisfactory recovery. Remember that although this is a frightful disease, needless fear and panic only cause more trouble.

6. Attempts to stop the spread of the virus by closing

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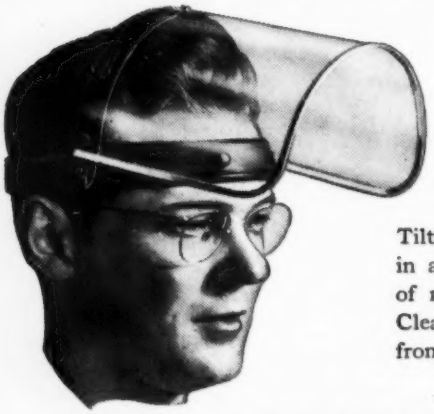

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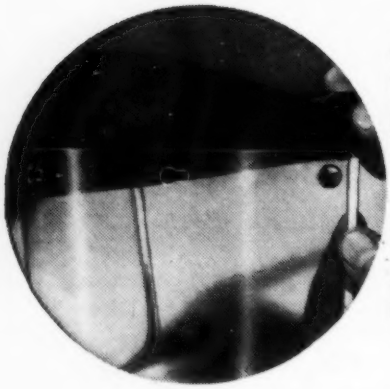

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all places where people congregate have been uniformly unsuccessful. The resulting disturbance to community life is a disadvantage. Today there is no way by which the spread of infantile paralysis can be completely stopped.

7. There is no known cure for infantile paralysis. Good medical care will prevent or correct some deformities. But in about every fourth or fifth case there will be permanent paralysis that cannot be overcome. Do not believe those who for one reason or another promise to cure these cases. Be guided by sound medical advice if polio does strike in your family.

8. County Chapters of the National Foundation for Infantile Paralysis are prepared to work with health officers, doctors, nurses, physical therapists, hospitals and patients. These Chapters stand ready to use their funds to assist the entire community. Know your Chapter—ask its help if needed—and volunteer to help your Chapter so that it will be able to render the necessary services.

Nurse Draft Abandoned

THE army abandoned its fight for a nurse draft law today (May 26) conceding that the end of German resistance and increased recruitment of nurses had eliminated the need. Acting Secretary of War Patterson suggested that the senate drop further action on the controversial bill, and Sen. Thomas (D., Utah) jumped to comply. "It seems to me this is a most satisfactory disposition of the difficult problem," the military affairs committee chairman said. "The most extreme emergency measure of the war has solved itself." Sen. Johnson (D., Colo.), who opposed the bill from the start, commented that Thomas' remark seemed very much of an understatement. "This is the very thing I've been trying to tell them," Johnson said. "When they got the lead out of their pants on the recruiting machinery they got plenty of nurses. There wasn't really a shortage of nurses, but an overdose of red tape."

—*Chicago Sunday Tribune*, May 27, 1945.

Medical Care Plans

IN THE United States there are thousands of prepayment medical care and hospitalization programs successfully operating. Roughly, these can be classified into eight types as follows:

1. Company or employee medical service plans.
2. Regular insurance company group policies.
3. Medical society approved or sponsored plans.
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5. Co-operative groups.
6. Consumer-sponsored plans.
7. Farm Security Administration operations.
8. Private group practice clinics.

It is estimated that such programs now provide prepayment facilities for approximately 25,000,000 people.

Company or employee medical service plans:

(a) Endicott-Johnson which owns and operates three clinics and a hospital and furnishes free to each worker and all dependents all medical care and hospitalization.

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(c) Abbott Laboratories which pays a substantial part of the cost of insurance disability, life, surgical care and hospitalization—for all employees and their dependents.

(d) Henry Kaiser who owns and operates clinics and hospitals and furnishes medical care and hospitalization for workers on a voluntary basis.

State-wide, physician-sponsored medical care plans:

Michigan and California Medical Service organizations which provide surgical and/or medical care to groups on a prepayment basis.

Local, physician-sponsored medical care plans:

Kansas City, Buffalo and others, which duplicate for local areas the service of state-wide groups.

—From "Brief Review of the Present Trends and Needs of Medical Practice," by J. A. LEPAK, M.D., F.A.C.P., in *Minnesota Medicine*, May, 1945.

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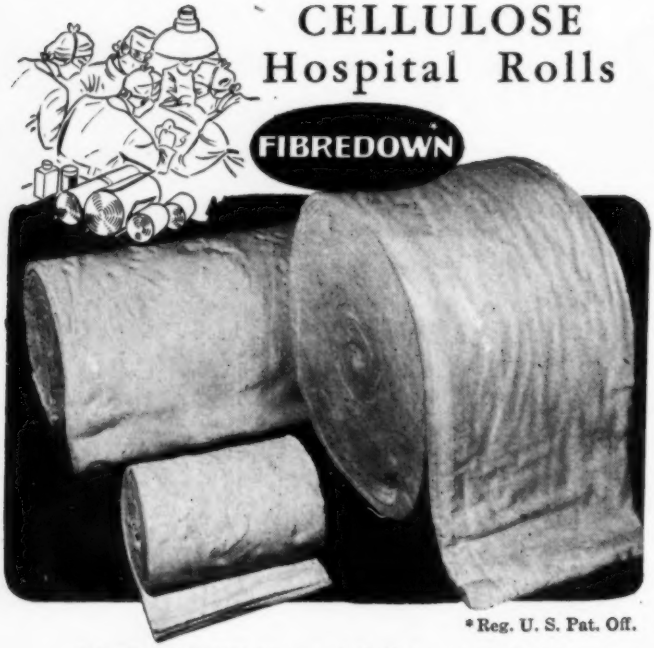

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PIONEERS IN STEREOSCOPIC VISION TESTING

COMMENT and OPINION

—*Continued from page 34.*

DR. PAUL A. NEAL, of the National Institute of Health. Later DR. ROBERT A. KEHOE, of the Kettering Laboratory at the University of Cincinnati, and DR. M. I. SMITH, Pharmacologist of the National Institute of Health, undertook supplementary work. There is complete agreement among these workers that DDT acts as a nerve poison when ingested or absorbed, that its toxicity to different warmblooded animals varies widely, but that its acute toxicity orally is not of a high order. It was early determined by DR. CALVERY that no toxicity or irritation develops from the application of 10% DDT in pyrophyllite applied as a dust to the skin. This lack of toxicity when applied in that way has been amply demonstrated by the free use of the powder by hundreds of thousands of troops and civilians in louse control. DDT in solution, however, can be absorbed through the skin. This is particularly true of oil solutions. There was some feeling that DDT solutions used as sprays and especially as aerosols might prove toxic but extensive tests by the National Institute of Health showed that animals exposed to very heavy doses in strengths adequate to kill insects produced no ill effects if the animals were prevented from licking the insecticides from their bodies . . . It may be concluded from available facts that DDT is much less dangerous to man and higher animals from direct toxic action than many insecticides but it should be handled with care especially to avoid ingestion and prolonged contact of oil solutions with the skin . . .

—From a lecture by DR. FRED C. BISHOP, Assistant Chief, Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, published in *Baltimore Health News*, May, 1945.

They "Accident the Positive"

THE following is from *Chicago Daily News*, Friday, May 26, 1945: "How 'accident proneness' haunts Chicago's war plants was told here today. Victims of this blight aren't merely careless—they just have accidents happen to them. Over and over they slip, trip, bump, collide, get kissed by truck fenders, scalded in shower baths and take it on the chin when the waiter spills a salad bowl. Dr. Alfred J. Cardall, a director of industrial relations, endeavored to explain why 'accident-prone' people get that way, at a session of the Greater Chicago Safety Council at the Hotel Knickerbocker. Basically it's a state of mind which causes grim fate to call two strikes on a chap as he starts the day's work, according to Cardall, an official of John B. Stetson Company. He reported that industrial surveys show that 50% of the accidents studied occurred when workers were 'feeling low,' depressed or fatigued. Improving safety machinery, supplying goggles and giving lectures aren't enough, according to the speaker. Some people, he indicated, attract accidents the way some dogs recruit fleas. 'Physiological invitation' is the highbrow name for it. 'Most accidents are not "accidental" but are symptomatic behavior of the individual,' he declared. 'Extreme cases of accident-proneness may make a worker unsafe in any normal plant environment.' Some workers just haven't got rhythm—the kind that's demanded, say, in operating a punch press where both the hand and foot are used. That sort is accident-prone. Others can't stand a monotonous job and thereby grow careless. Others are emotionally unstable. Some insurance companies, it was pointed out, don't give auto insurance to persons with a record of frequent crashes."

—*Continued on page 556.*

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INDUSTRIAL HEALTH and DISEASE

The Value of a Medical Service

—In a Small Industrial Plant—

GLENN S. EVERTS, M.D.,
Melrose Park, Pennsylvania

BEING the plant physician for some 20 small plants in Philadelphia during the past 18 years, and continuously the physician for five of them for 14 years I have come into rather intimate association with many executives. It has been my observation that each of those executives has a reason for maintaining a plant medical service which varies according to the different emphasis placed on the following two factors: first, the value of the nurse and doctor in treating accidents; and second, their value in serving as the clearinghouse for all manner of problems involving the physical and mental health of the employees.

If a plant has a large number of accidents, the dollar-and-cents reason for a medical service is apparent, no matter how many pre-employment examinations or other health matters flow through the dispensary. But, if a plant is comparatively free from accidents, then you can be sure that its top executives are sold on the idea that money spent for a medical service is worth while. They believe that knowing something about the physical fitness of their new employees and conserving the health of their older ones makes good sense. Let us cite an example or two to illustrate these thoughts.

One of the plants with which I am familiar has an average of 100 employees. It has had a dispensary for 18 years. The plant has less than five lost-time accidents per year. The management has been willing to pay nearly $11.00 per employee per year for medical service which includes more than the usual number of the doctor's hours per week needed for a plant of this size. One of the services most appreciated by the executives is that which the physician renders by checking the progress of the employees who are absent because of illness, especially those of long service with the company—whether or not they are getting satisfactory medical care, and when they may return to work. Most of the older employees in this plant have had eight or more check-up physical examinations, and the executives believe in this re-examination program.

Another plant of 225 employees has had a dispensary for 14 years. Here the lost-time accidents average less than nine per year. The service costs a little more than $8.00 per employee per year. In this plant the executives themselves frequently come to the dispensary for preventive medical care. Comments made by them from time to time reveal their belief in the dispensary as a stabilizer of employee morale. But although they, too, are concerned about the welfare of their sick employees, they believe the dispensary serves its most practical purpose as a clearinghouse for numerous minor health matters.

About 500 workers are employed at the third plant. The part-time services of a nurse and doctor began in 1930. In the beginning it took eleven interviews with one or all three executives before they decided to test the value of a medical service. They studied the matter from all angles. Since then they have remodeled the dispensary four times, each time enlarging it, and as yet have not denied a single request for equipment. And within the first year after the dispensary was opened, they increased the time of the nurse from 10 hours per week to full time. The reason they made this increase was as follows: Although the plant averages less than 20 lost-time accidents per year, these executives observed that whenever some one did have an accident, in the absence of the nurse considerable time was lost by varying numbers of curious and would-be helpful employees. On the basis of that resulting lost production, they calculated it would be cheaper to have the nurse there all day. And they were right! Likewise, in this same plant, the executives are wholeheartedly behind the pre-employment examination program for new employees and the health-conservation examination for the older ones. So, in presenting the varying attitudes of the executives of these three plants, we have illustrated a few of the reasons why a medical service in a plant with comparatively little accident work is worth while.

There is a pamphlet prepared by the Health Committee of the Chamber of Commerce and Board of Trade of Philadelphia entitled "Why Plant Industrial Medical Service Should Be Adopted." In it there is set down in a question-and-answer form many of the important matters with which any interested businessman would want to become familiar. There are explanatory answers to such questions as: "Will a medical service decrease lost time due to accidents?" "Will a medical service decrease man-hours lost through illness?" "What is the scope of a good medical service for a small plant?" But rather than repeat what can easily be read, or go into detail about matters which only an individual interview could satisfy, I believe you would be more interested in a few of the less conspicuous reasons why executives hang on to their medical services even through depressions.

The little services which make up a fair share of the routine work of the dispensary can be divided into two groups: (1) the things done for the employees themselves; and (2) the things done which come more as a request from the management, usually a foreman.

Bill, an injured employee, who has been losing time but is about ready to return to work, says: "Look here, Doctor, I'd like to get back to work. I feel pretty good, but I doubt if I could do that job the foreman had me on. Not yet anyway. Do you think I'd be all right on that other job?" So, the doctor considers the case and may contact the foreman about a tem-

DR. EVERTS is the First Councilor District member of the Commission on Industrial Health and Hygiene of The Medical Society of the State of Pennsylvania. His article from which the foregoing is taken, was published in *Pennsylvania Med. J.*, 48: 2, November, 1944.

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porary change for Bill. The question of change may involve a question of hourly rate, or in a small plant it may not be easy to make room for Bill anywhere but at his regular job. So perhaps Bill will have to wait until his injury heals more before it is wise to allow him to return to his usual job again. It is largely up to the doctor to decide.

Sam comes into the dispensary and says: "You know, Doctor, the other day I had my wife down to see Dr. Jones, and he tells me that she has got to go under an operation. He says, etc., etc. What do you think about it?" So the doctor takes time to give Sam as satisfying an answer as possible. Sam's wife is going to be on Sam's mind for awhile a lot more than is his job and he will appreciate the advice of a disinterested medical friend.

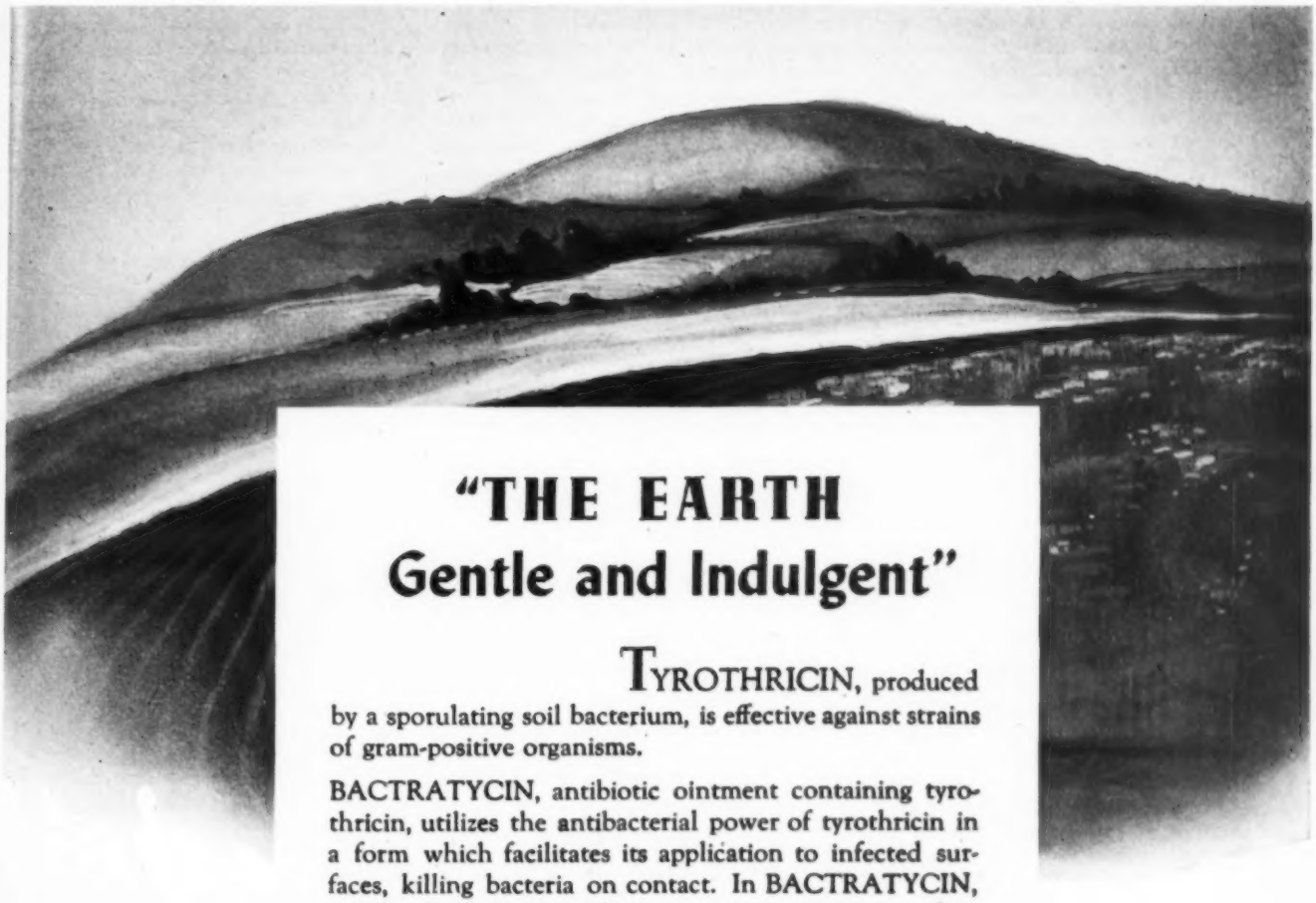
Either the doctor or the nurse in most plants comes to be the listening post for all manner of complaints about working conditions, both real and fancied. The chief reason for this is because both the employees and the foremen believe that the medical personnel can best "get the ear" of the management. At any rate, the merit of each case is studied. Now and then the complaint is justified, and the matter is discussed with the proper individual looking toward the correction of the condition. Often it is found, however, that some employees honestly can't "take it" working in certain places, while other employees don't want to "take it" but are not beyond using the complaint as an excuse to be moved to some other more desirable job. It is largely the work of the dispensary to get to the bottom of the story.

John, who has been off the job for awhile, comes in to ask: "Why won't the insurance company pay me for this here arm of mine? I got it here." The doctor takes time to explain that, although the condition did arise from his work (an inflammation of a tendon sheath from repeated motion on the job), nevertheless it is not regarded as an accident in Pennsylvania because it does not follow the accepted definition of an accident, according to law; so, as things stand, it is neither the fault of the insurance company nor the fault of the plant if he is not paid compensation for it. And somewhat the same explanation, although more difficult for him to understand, must occasionally be given to John in the case of certain ruptures. Usually, if John understands what it is all about, at least he does not continue to blame the plant management for what he believes is a "raw deal."

One of the foremen 'phones to the dispensary and asks the doctor about George. His story runs something like this: "What do you suppose has gone wrong with George in the past few weeks? He tries to dodge every job I put him on. Is he really sick or just plain lazy? He didn't used to be like that. I'm going to send him up to you. See if you can find out what's the matter." And so George comes up and has a chat with the doctor. Occasionally the doctor finds some real physical ailment which can account for the way George has been slipping. But, more often than not, he uncovers some personal-relations trouble mixed up in the picture. In either case the doctor tactfully tries to do what seems best in the interest of both employee and management.

Another foreman may come to the dispensary with an anxious look on his face and start out as follows: "Listen, Doctor, we're stuck for help this morning. Harry wants to go home—says he's sick. I wonder if there is anything you can do to keep him on the job? Of course, if the guy's sick, he's sick. Whatever you say goes, but we need him pretty bad." And again the medical personnel, often a good nurse, can recognize Harry's ailment, either as temporary, and needing only minor medication to tide him over the day, or as a definite illness justifying the attention of his family physician at home.

Occasionally the superintendent will stop by to say that Mary has been asking him repeatedly for a change to another department. "She says she has rheumatism and can't work in that room downstairs because it's too damp and makes it worse." The doctor, however, may find that, according



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to her physical examination record and past dispensary visits, Mary has never complained of rheumatism before. When he calls her in to consider the transfer, he finds that probably she does have a slight neuritis, but that she has been wearing clothing only about half as adequate as necessary for her work place, and shoes that amount to almost nothing in the way of foot protection. So he says to Mary that if she still has this pain after taking medication for a few days and wearing the proper clothing and shoes for a week she is to return to the dispensary and he will reconsider her plea for a change of jobs.

And last we want to mention the dependence which the managements of war-contract plants place in the dispensary in the matter of requests for work releases based upon illness, due to alleged work conditions or otherwise. The plant physician is in an especially good position to evaluate the genuineness of a case, both from his own records and the information gathered in discussion with the employee's family physician. The object, of course, is to be fair both to employee and to management. But some of the cases take considerable analysis before one can be sure no injustice is being done. It's the doctor's job.

In the foregoing remarks we have tried to give you a close-up picture of the work of the average small plant dispensary, aside from the routine of taking care of accidents, examining new and old employees, giving temporary help to those slightly ill, and guidance to those needing serious attention. The executives of these smaller plants are convinced that a medical service is worth while and that it saves them money. For some time, however, it has been my personal feeling that most of them appreciate having some medical person within the plant itself to whom they can refer these so-called borderline health problems even more than they appreciate the quality or volume of the routine dispensary work.

Therefore, irrespective of what part of the dispensary program most appeals to you, consider now the idea of an adequate part-time medical service for your small plant as an asset in the postwar production program.

Pre-Placement Physical Examinations

—Recent Developments—

C. M. PETERSON, M.D.,
Secretary, Council on Industrial Health,
American Medical Association

THE Council on Industrial Health of the American Medical Association is about seven or eight years old. I expect it must have been, therefore, seven or eight years ago that we realized that if the medical profession was to make any lasting contribution to industrial health, it must be on the basis of an adequate industrial physical examination.

Very shortly after we started our activities, therefore, the Council appointed a committee on physical examinations. We undertook to prepare what we thought was a basic statement, which physicians could adopt in their approach to an industrial health program. After correspondence with a half a hundred representative industrial medical departments, we acquired what we considered a general understanding of what had been found acceptable industrial physical examination procedure in industry. With that information at hand, we prepared a report, which was published in the *Journal of the American Medical Association* and in that way brought rather widely to the attention of the practicing medical profession.

Subsequently we ran into the enormously important problem of proper placement in industry. We realized that if we were going to make any impression upon that particular problem we would have to construct a

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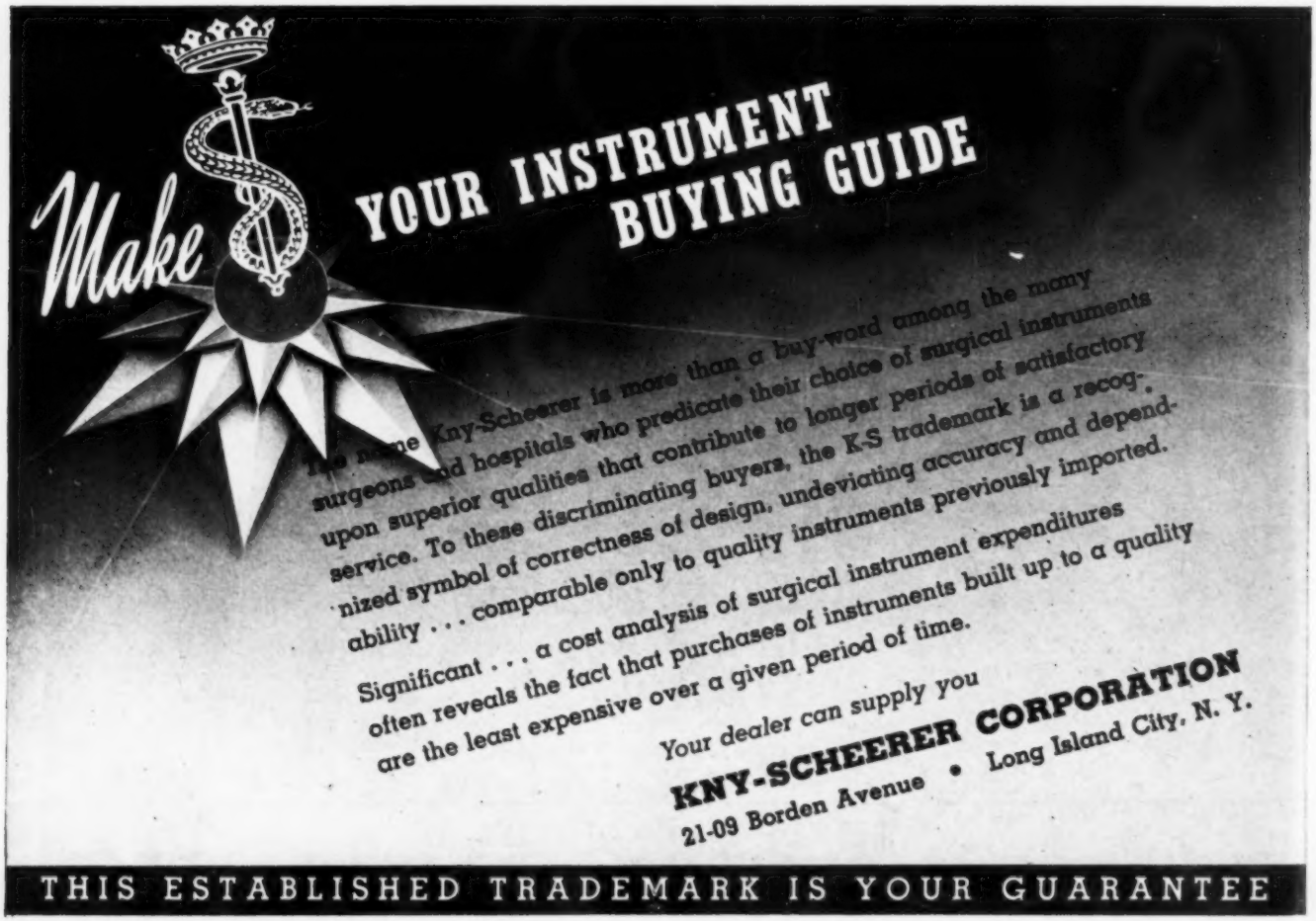
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statement which would represent accepted terminology, not only on the part of medicine, but also on the part of management and labor. So we took our original statement on physical examinations, which had been reasonably well disseminated, and we invited representatives of management, the National Association of Manufacturers and the U. S. Chamber of Commerce, representatives of insurance, the Joint Claims Committee of the Mutual and Stock Casualty Companies, and of labor—AFL and CIO—and asked them in conference assembled to review our original report, take it apart, reassemble it, and try to agree on common language which could be applicable to all interested agencies.

In the course of events we have a report which has been ratified by most of the orginal conferees who met with us in Washington last May.

It was instructive, I think, for the medical people represented there to find how few controversial issues there were in the physical examination program. There were, to be sure, some problems to iron out in respect to the scope of the examination, its purpose. We agreed that the purpose of industrial health programs is to promote and maintain the physical and mental welfare of all industrial employees, and that health examinations in industry are a means to this end.

In connection with this purpose, we felt also that unjust or questionable exclusion from work, through improper application of the findings on health examinations in industry, is against the public welfare and contrary to sound industrial health principles, and that from the public and industrial health standpoint, the only absolute bars to immediate employment in non-hazardous occupations should be communicable disease, mental illness where impaired judgment prevents cooperative effort, and certain incapacitating injuries or diseases.

Need Instruction

Now so far as the medical components of the examination were concerned, we found that both management and industry were quite content to leave those technical aspects to the medical representatives there. But in connection with records, for instance, we found that it was possible, so far as terminology is concerned—and I want you to remember that by and large we in the American Medical Association are not addressing ourselves necessarily to the medical departments of large industries. We have, as far as our membership goes, a great many physicians who only apply themselves in the industrial environment part-time or on-call. They do need a considerable amount of instruction as to how they should conduct themselves in relation to the best interests of industrial health, as a factor in public health as a whole.

We agreed that a rating program was desirable, and that this rating could be reduced to three major classifications: First, the individual is found fit for all work; second, fit for work under periodic medical review; and third, unfit for work at the time of the examination. We regarded that as the irreducible number of classifications in which results of a physical appraisal could be expressed.

In respect of the preservation and use of industrial physical examination records, we expressed it this way, and this was concurred in by the conferees. The examining physician may properly put information derived from records of industrial health examination to the following uses:

First, all major findings should be discussed with the worker, with emphasis on the importance of obtaining immediate and adequate medical care. It is quite obvious that there is not much sense in undertaking an extensive program of physical appraisal if the information is to be filed in the archives of the industrial medical department and nothing further done about it.

Second, that a transcript may be supplied to the employee's personal physician, or to other official community health agencies, on request or

consent of the employee. That again underscores certain obligations which exist between an examining physician and the examinee.

Third, the employer should be given information in accordance with the rating plan which I enumerated just now, to facilitate placement and promotion. We felt that a simple form could readily be devised by any physician for this particular purpose. Certainly the employer should be especially notified of any condition of disability thought to be caused by faulty work environment.

Finally, the examining physician must make available his records to any governmental agency, such as courts, Workmen's Compensation Commissions, or health authorities, on legally enforceable official order, or when required by law.

Confidential Records

IN ALL other respects, the confidential character of the health examination records should be rigidly observed and access should be granted only on consent, in writing, of the worker, preferably after preliminary discussion with the examining physician.

We discussed personnel. We decided that under certain circumstances it would be quite appropriate for technical people, under the supervision of the medical department, to undertake certain aspects of the examination.

In respect of costs, it was felt that industry should furnish, without charge, all medical and clinical assistance essential to the health examination program.

And finally, there was attached a review and appeal clause, which reads as follows:

"When a worker has been physically examined and the doctor making the examination reports that the examinee is physically unfit for any work or for certain classes of work, which report may have an adverse effect upon the employment of such worker, the following procedure shall apply: The worker may designate a physician of his choice and request a review of the findings made by the examining physician. These two may proceed to render a joint report, or, if they are not in agreement, then a third physician agreed upon by the two others shall be selected and his findings should be final. If the two physicians cannot agree upon a third physician, then the chairman of the Industrial Commission in the state in which the plant is located shall make the selection."

That, in essence, is the substance of the original conference group which dealt with the problem of industrial physical examinations and, although the whole report is still in the process of discussion, we are now, I believe, prepared to go to our membership, as far as medicine is concerned, and say that we have a basic report which has received approval by

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these other agencies which have expressed an essential interest.

More recently in Washington we undertook some discussion of the correlation of findings developed in a physical examination program with the present science—I expect you would call it a science—of job analysis, and we have undertaken some preliminary conversations with the Occupational Analysis Division of the War Manpower Commission, mainly to facilitate assignment of handicapped individuals to "must" industries in certain localities, or transfer to such "must" industries, and also to review periodically the proper correlation which should exist in the establishment of standards of physical examination and the establishment of standards of job analysis. These meetings, I expect, will occur periodically, and there should be periodic release of information which would be equally interesting to the medical profession engaged in industrial medicine, and management.

It is time now to publicize the general agreement which we have reached, and bring it to the attention of the membership in the organizations which made up the conference group. We do have such an opportunity to broadcast this statement and make a substantial contribution to the welfare of the industrial worker and to the productive capacity of the country.

Aircraft Industry Nutrition Program

RESULTS of the rigorously controlled large-scale experiment on the effect of a "vitamin-mineral" supplement on the industrial efficiency of workers at the Lockheed Aircraft Corporation, Burbank, California, have been disclosed by the California Institute of Technology in Pasadena and the National Research Council's Committee on the Nutrition of Industrial Workers.

A conservative estimate of the overall gain to production from the physiological effect of the "vitamin-mineral" supplement, after all psychological effects were eliminated, is 10.5 working days per man per year. This corresponds to a gain in manpower of 4.1%.

Of this total gain of 4.1%, 62.9% was due to better general work performance, reduced absenteeism contributed 21.6%, and reduced turnover 15.5%.

The percentage reduction in absenteeism as compared with that in the control group was 18.6%, in turnover 26.9%, and improvement in general work performance 2.6%. Although the last figure (expressed as a per cent) is the smallest, the actual gain from improved work performance is greatest because all the workers are affected, whereas in the case of absenteeism and turnover only a fraction of the total number of workers is affected.

The estimates of the result obtained are based on performance data and not on subjective reports of the subjects. The data are consistent in showing a physiological benefit from the "vitamin-mineral" supplement not ascribable to any psychological influence. The physiological and psychological effects were additive.

Definite evidence of a psychological effect was one of the interesting findings of the study. This effect may be attributed to the element of selection of the subjects through the fact that they volunteered for the test and knew that therefore they were participating in a health study. By the use of appropriate controls it was possible to separate the psychological from the physiological effects. The psychological effect influenced only absenteeism; general work performance and the rate of turnover were not affected by it. The psychological effect alone reduced absenteeism by 29.3%; the physiological effect caused an additional reduction of 18.6% in the group who received the "vitamin-mineral" supplement, and in different sub-groups it varied from 11.7 to 35.5%.

The psychological effect appeared very early in the study and became less and less effective as the study year progressed, whereas the physiological effect built up slowly, was not manifest until four to six months, and then persisted until the end of the study year.

The study was sponsored jointly by the Nutrition Committee (Dr. Robert A. Millikan, Chairman) appointed by the Los Angeles County Board of

The report in full appears in the current issue of the *Quarterly* (23: 2, April, 1945) of the Milbank Memorial Fund, New York City.

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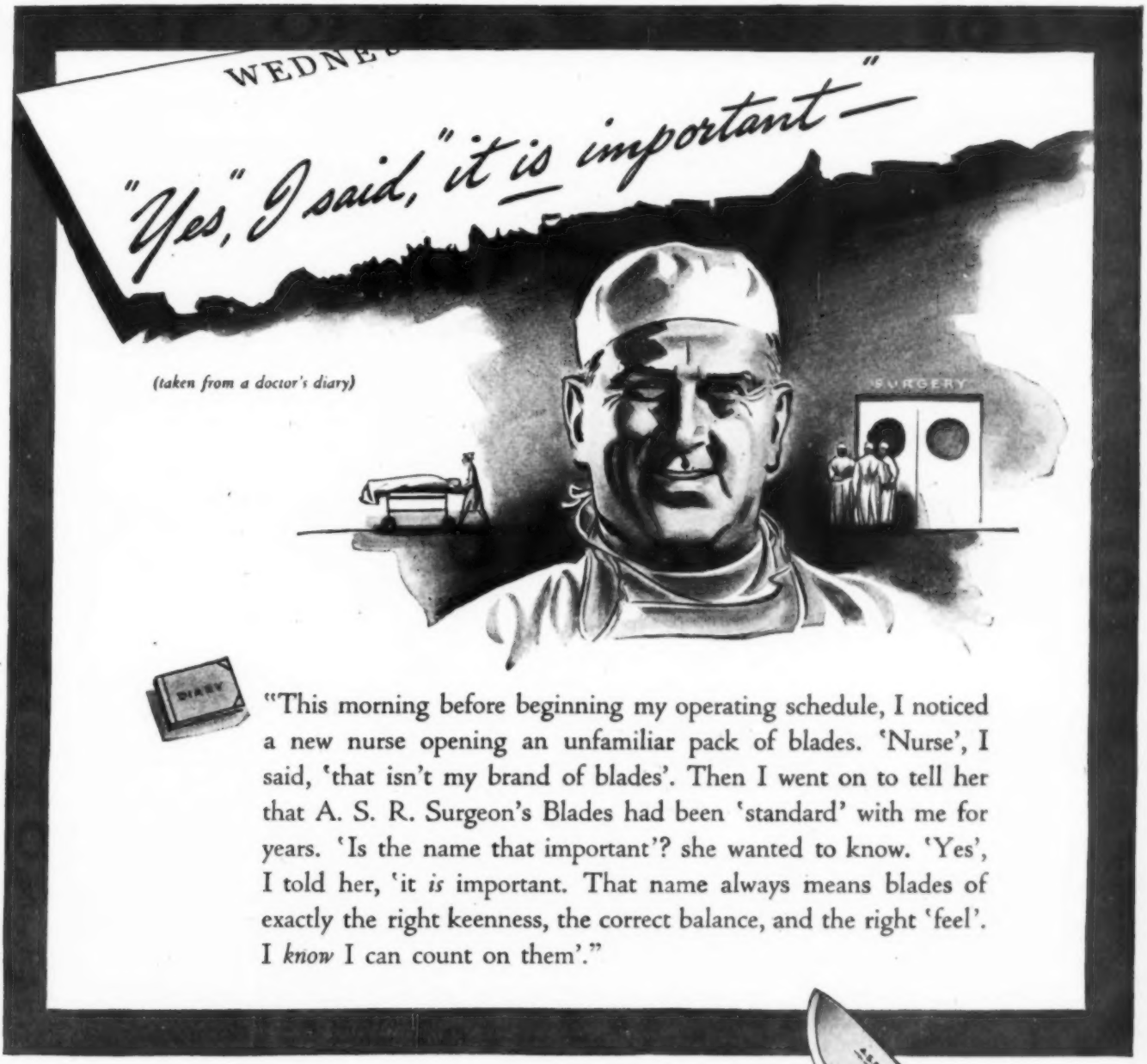

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Supervisors, and by the Committee on the Nutrition of Industrial Workers of the National Research Council, and was supported by the sponsors and by the following: California Fruit Growers Exchange, California Institute of Technology, Gelatin Products Corporation, Hoffman-LaRoche Inc., Merck & Company, Milbank Memorial Fund of New York, National Oil Products Company, the Research Corporation of New York, Squibb & Company, Lockheed Aircraft Corporation, Vita-Food Corporation, the War Production Board and the Works Project Administration. The local AFL union approved of the study at its inception and cooperated fully.

The subjects were a superior group of relatively young workers all of whom volunteered. None of the men had any evidence of severe nutritional disease. Consequently there was no opportunity for the dramatic results which might have been expected had there been a high incidence of such diseases.

The study ran for a year from March 1, 1942, to February 28, 1943, preceded by a three-months' period in which all the subjects were given a thorough medical examination and other special tests. All the subjects were again examined at the end of the study. Diet histories were taken at the beginning and end of the study. The diets of the men remained essentially unchanged throughout the year of the study.

The following was the composition of the "vitamin-mineral" supplement:

	(International Units)
Vitamin A (from fish liver oil)	50,000
Vitamin D (from fish liver oil)	800
	(Milligrams)
Vitamin B_1 (synthetic)	10
Vitamin B_2 (synthetic)	10
Niacinamide (synthetic)	100
Vitamin C (synthetic)	250
Calcium (calcium carbonate)	500

These amounts of vitamins are two to five times larger than those recommended for a good diet; the calcium is equivalent to one and one-half pints of milk.

The men received the "vitamin-mineral" supplement, under observation, in capsules and pills twice a day while they were at work, five days a week.

The study was undertaken in response to the recommendation of the National Research Council's Committee on the Nutrition of Industrial Workers: "That adequately controlled studies be conducted in selected war or defense industries to determine the facts concerning the influence of diet and nutrition on health, working capacity, incidents of accidents, absenteeism, and the psychological state."

The report concludes with the following summary of the results: "The consistency of the trend toward superior performance as the study year progressed is the most persuasive feature of the evidence for crediting benefit to the therapeutic effect of the vitamin supplement. This consistency runs through all the reasons given for absence, through the data on turnover, and all six individual items characterizing work performance; it is seen also in the comparisons of the total population and of sub-groups."

The Medical Officer

—And Future Industrial Medical Practice—

LIEUTENANT COLONEL HAROLD C. LUETH,
Surgeon General's Liaison Officer,
Medical Corps, Army of the United States

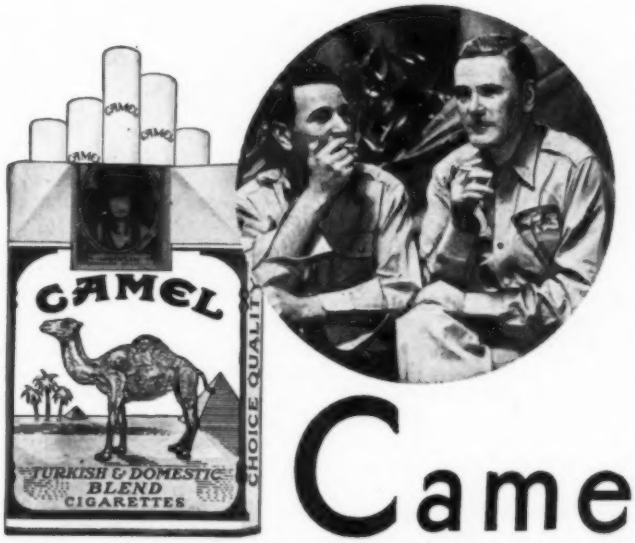
INTEREST in the practice of industrial medicine has been constantly growing among the medical profession. Since the war started there have of necessity been certain changes, especially a curtailment of qualified personnel. For purposes of future planning it is desirable to have an estimate of the likely status of industrial health in the future.

From the *Journal of the American Medical Association*, 128: 2, 93-94, May 12, 1945.

The Flying Capsules

R. J. Reynolds Tobacco Company, Winston-Salem, N. C.

Now in use on the battle fronts, for speedy evacuation of wounded from nearly inaccessible areas, is this Helicopter with "capsule" stretchers attached to sides



WHEREVER our soldiers are fighting, Army medical men have established a speedy life line for wounded. So fast and so efficient is it that often the wounded are under the care of skilled medical officers *within a matter of mere minutes!*

In this stepped-up tempo of war, however, the Army doctor finds little "time out" for himself. When there is a "break" in his long hours, his relaxation may be limited to a few pleasant moments with a cigarette... very likely a Camel, for Camels are such a big favorite with men in all the services.

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Dept. IM, Malden, Mass.

CUTICURA *Soap* AND *Ointment*

The Committee on Postwar Medical Service made a study of the future desires of medical officers. At the time the committee devised its questionnaire, arrangements were made for the inclusion of questions concerning industrial practice. A pilot questionnaire mailed to 3,000 medical officers included a number of questions concerning industrial practice; in the response to this inquiry a small number of men indicated interest in the several fields of industrial practice. A final questionnaire was later prepared and distributed to each medical officer on active duty with the Army, Navy, Public Health Service and Veterans Administration. Owing to limitations of space and the indicated limited interest in industrial health compared to other features of general medical practice, the section on industrial practice of the questionnaire was brief.

The first question asked was "Would you wish a position in industrial medical practice?" One fourth of all men, or 4,215 who returned questionnaires, indicated that they were interested in the industrial field. There were 863 men who wanted full-time positions and 3,352 men who wanted part-time positions. Requests for full-time positions in industrial practice were scattered among the different graduation groups. For example, there were 73 requests from graduates of 1941 to 1943; 164 from graduates of 1938 to 1940; 136 from graduates of 1935 to 1937; 285 from graduates of 1930 to 1934; 153 from graduates of 1920 to 1929 and 52 from graduates of before 1920. About 80% of the total, or 16,579 medical officers definitely indicated that they were not interested in industrial practice.

Another question asked was "Would you wish special training to qualify for such a position?" Medical officers who would like to have full-time positions in industrial medicine were about equally divided; there were 484, or 56%, who wanted special training, and 379, or 44%, who did not want special training. The greatest number of requests for special training came from the youngest graduates. The other graduation groups were about evenly divided between those who wanted special training and those who did not. The following numbers of requests came from the several graduation groups: 59 from group 1, 88 from group 2, 99 from group 3, 118 from group 4, 95 from group 5, and 25 from group 6.

About four times as many men wanted part-time positions in industrial medicine as wanted full-time positions. Requests came from about the same number of men in each of the first four graduation groups. There were 716 requests from graduates of 1941 to 1943. 773 requests from graduates of 1938 to 1940, 672 requests from graduates of 1935 to 1937, 768 requests from graduates of 1930 to 1934, 388 requests from graduates of 1920 to 1929 and 35 requests from graduates of before 1920.

A little more than one third of the men who would like to engage in part-time industrial medical practice would also like to take special training to qualify for positions. Nearly the same ratio of men who wanted special training to the total number in the graduation group was observed in each of the six graduation groups. Requests for special training came from 311 officers of group 1, 299 of group 2, 233 of group 3, 274 of group 4, 130 of group 5, and 52 of group 6.

There were 235 medical officers who were undecided about future work in industrial health, among whom 65 definitely requested further training.

Special courses in industrial health were requested by a total of 1,809 medical officers. They included men who desired full-time positions in industrial medicine, men who desired part-time positions in industrial medicine and men who were undecided about future positions in industrial medicine. The following number of men made requests: 381 from graduates of 1941 to 1943, 405 from graduates of 1938 to 1940, 346 from graduates of 1935 to 1937, 408 from graduates of 1930 to 1934, 231 from graduates of 1920 to 1929 and 38 from graduates of before 1920.

The questionnaire was divided into six parts: (1) general information, (2) educational, (3) industrial, (4)

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practice and licensure, (5) economic, and (6) additional information. On the front of the questionnaire the educational portion occupied three-fourths of the page, and it listed different types of training, such as internship, residency, fellowship, review courses and "other." It also listed a number of special forms of medical practice. As a result there were a number of men who entered their desire for additional training in industrial work under the educational portion of the questionnaire.[1] They naturally represented a much smaller group than those who indicated their desire for special training under the industrial section, since the questions under the latter section focused attention on the possibilities of future training and practice.

Under the educational section there were 34 requests for training in industrial medicine; of these, 21 men wanted short courses and 13 wanted long courses. There was one request for insurance training.

Short Courses. — Requests came from three graduates of group 2, four of group 3, nine of group 4, and five of group 5, and most of them were for unspecified periods of training. Almost all of them had been on active military duty for two or more years.

Long Courses. — Thirteen medical officers requested training in industrial medicine and one in insurance work. Nearly all who wanted future training in industrial medicine were graduates before 1934 and preferred courses of six to 12 months. About half the men were in industrial practice before entering the military service; the other half were formerly in private medical practice. The request for insurance training came from a 1942 graduate who entered the Army from internship and who wanted a two-year course.

Returns from the final questionnaires indicated that about 4% of men in each graduation group, except group 1, wanted full-time positions in industrial medicine. There were only 1.7% of the medical officers in graduation group 1 who were interested in full-time industrial positions. From the pilot questionnaire[2] it was shown that more than seven times as many men desired a university course of training as desired training in industry. The study also revealed that the major fields of interest were industrial surgery, insurance and plant medical department work. From this it appears that those interested in furthering sound future industrial medical practice should seek to interest younger medical officers by acquainting them with opportunities along the line of university training supplemented by in-service training in industrial plants.

Since the various aspects of industrial medical practice will be most influenced by the character and number of physicians who engage in its full-time practice, encouragement of sufficient numbers of younger men in the field among whom the more capable may be selected for thorough training in its different aspects is the best assurance of meeting the objectives of good industrial medical practice in the future.

Over 16% of the medical officers in each graduation group wanted part-time positions in industrial medicine. While physicians engaged in part-time industrial medicine render important service concerning care of patients, it is doubtful that they exert much influence on the future development of the field. Many men engaged in part-time industrial practice are interested in the financial returns and view the positions as an economic security and are only secondarily concerned with future developments of sound, high grade industrial medical practice.

Improvement of training facilities in both universities and industry and the selection of the more qualified younger men for full-time positions, it is believed, will be instrumental in the development of improved industrial medical practice both for full-time and part-time practitioners.

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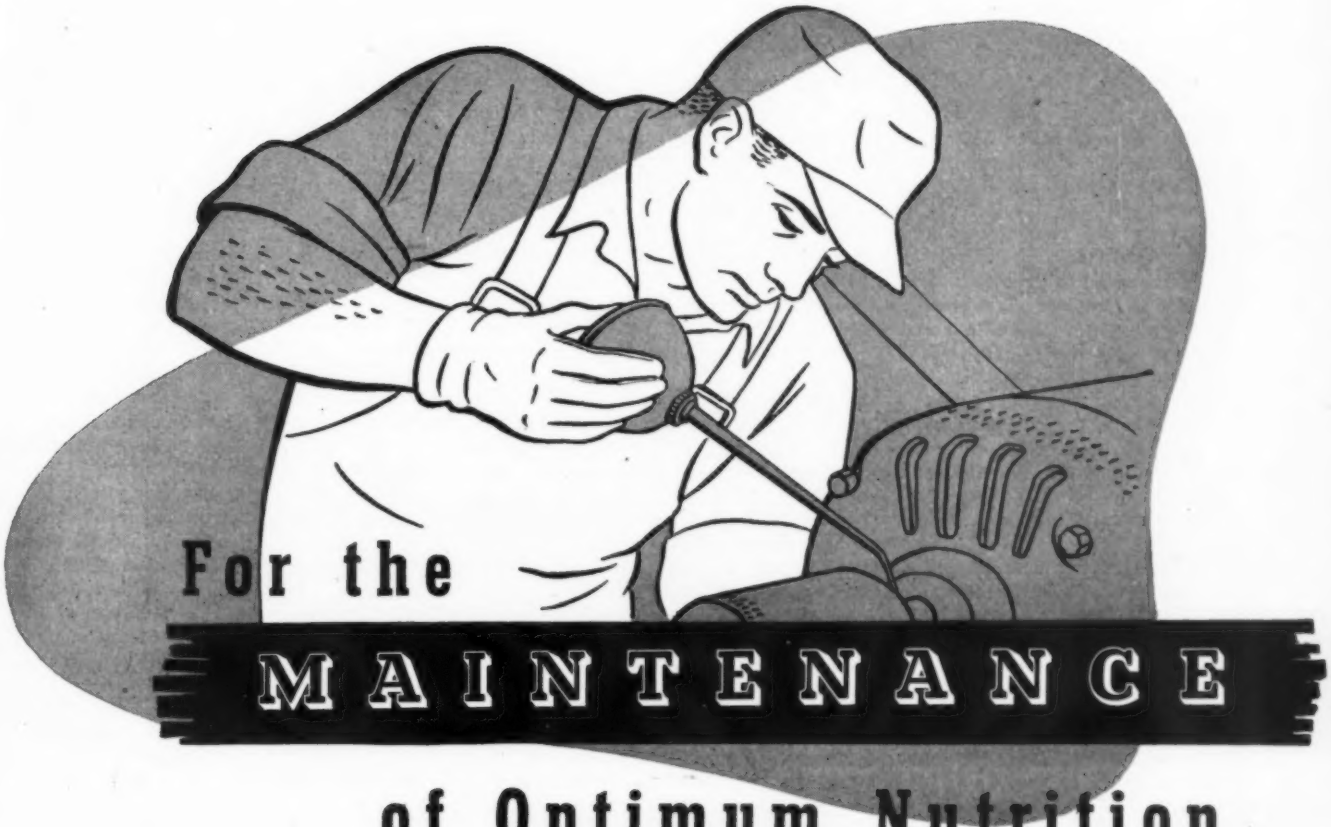

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THE OLD adage from which the title of this paper was taken seems to me appropriate to a discussion of personnel relationships in industry. The concentration on the drives in industry during the past decades is due for a re-evaluation, particularly in view of the multiple problems that face industry in the postwar period.

It is not my purpose here to wave the banner of psychiatry; I should prefer to speak as one practical man to another, seeking ways and means of applying in industry the principles of psychiatry, through developing an approach to the problems of personnel relationships based on an understanding of human nature and human personality.

I was myself a pioneer in industrial medicine, and in 1915 I became the first psychiatrist to venture into industry when I went with the Cheney Silk Company on a full-time basis, and eventually became their personnel manager. During that time, we established the fact that psychoneuroses and emotional attitudes on the part of employees toward their employment, their foremen, their fellow workers, and the machines in the great textile industry were responsible for a greater loss in dollars and cents than accidents and contagion.

In 1922, my contemporary, Dr. Elmer E. Southard, of Harvard University, in the course of a survey sponsored by the Engineering Foundation, found that 62% of the cases observed reached the discharge status through traits of social incompetence rather than through occupational incompetence. Dr. Southard's conclusions, like my own, were that "what might be termed dissatisfaction, both on the part of employer and the employee, arose not from the employee's inherent inability to do the work, but rather from his failure to adjust himself to the conditions under which he was to work."

These are but two examples of early research in industry that have been carried on for the past 30 years, and the final findings all agree on this point: You can teach a man to operate a machine, you give him good working conditions, you can give him security in his job—but it is the man's own emotional drives that determine whether he will become a real success from his own standpoint. Thus, if we are practical, we must study the factors that will develop a man's emotional drive to the end that he may be a cooperative member of a producing team. We must face realistically the fact that both management and labor share the problems of production-for-profit; and since the employee serves the employer in order that the employer may better serve industry, the well-adjusted employee pays dividends.

WORKERS, like all other human beings, have psychological and social, as well as economic needs; and the worker who is most profitable to himself and to industry is the one who finds in his work a means of self-expression and a satisfaction of his needs for group relationships. If you din into a man that he is unimportant and that his contribution is ineffectual, he will become irresponsible; if you overinflate his ego, he will "swell up like a poisoned pup" and become a nuisance. The real problem—and this is the key to all constructive thinking—the real problem is to make a man feel as important as he really is by making him as important as he is capable of being.

To the extent that a man feels essential, he will become a responsible and productive citizen and worker. The great function of psychiatry in industry is to point the way more directly toward the realization of this goal. I have no intention of presenting you with a treatise on psychotherapeutics. Diagnostic techniques — or what is popularly called "the best

---

Presented at a session on "Mental Hygiene and Personnel Relations" at the Eleventh Annual Meeting of the Texas Society for Mental Hygiene, Houston, March 2, 1944; published in *Mental Hygiene*, 29: 2, 208-216, April, 1945.

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way of spotting the screwballs"—and the whole subject of neurological organic disorders, psychoses, neuroses, and maladjustments are subjects for the consideration of your industrial doctors. But I do intend to outline those broader considerations of policy which will grow out of an industrial philosophy that takes into account the human drives fundamental to mental health in any industrial organization.

It is necessary, however, to define clearly the functions of the psychiatrist or the medical man who heads the medical department of an industrial organization. In the interests of a sound program of mental health, he should be first of all a doctor, maintaining zealously at all times the confidential doctor-patient relationship with all members of the organization. He should be only secondly an officer of the company. When the reverse is true, industry has only a medical technician, doing an obvious technician's job. The real profit to industry comes from the service of a doctor, whose professional standards and ethics are respected and taken for granted both by management and by workers.

The physician in industry, who should possess a psychiatric point of view, must have two main functions. One is administration in the matter of placement—and here it may be well to utter a word of caution that he must be careful not to become a "medical policeman," whose job is merely "to keep the screwballs out," for in that case it may become a game with prospective workers "to fool the nut pick." Again in connection with placement, he has the all-important function of seeing to it that no man is placed on a job that is injurious to his health or beyond his physical or mental capacities.

To repeat, the function of the medical man in industry in connection with placement is not that of a medical policeman, but of assisting a man to get a job he really can do; of protecting the health, life, and limb of those already on the payroll; and of preventing any new employees from bringing contagion into the plant and thereby menacing the health of those about him.

When the workers know that the various health examinations, routine check-ups, and frequent medical reviews are for their own protection—as in the case that the man working next to them on the assembly line might have something "catching"—they will back up the doctor's program with respect and cooperation. But the doctor must be the friend and not the disciplinarian.

If the man in industry with a psychiatric point of view has avoided the pitfall of being regarded as a medical policeman in the employ of the management, and has maintained the confidential patient-doctor relationship, he will have a golden opportunity to serve the worker, to serve the management, and to serve the in-

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dustry as a whole through the psychiatric point of view.

I am inclined to believe that it is unnecessary to present this psychiatric point of view as something separate and apart from the rest of industrial medicine and of employment practice, as only too often a man wil run from a psychiatric consultation which he will welcome under another label. If the industrial medical man will bear this in mind, he will be able to observe and to diagnose neuropsychiatric symptoms without arousing suspicion, resentment, or alarm.

The purpose of psychiatry in industry is "to clear the tracks" for active, vigorous enjoyment of the job to be done, in the interests of maximum efficiency and minimum loss; it is certainly not its purpose to bandy about the terminology of psychiatry to the point where the entire personnel is bent on psychoanalyzing their inmost thoughts. If that happened, we should have something to worry about! Let our psychiatric services emanate from the doctor-patient relationships, and let us be wary of establishing an attitude whereby the worker takes time from the assembly line to go in for a good cry on the psychiatrist's shoulder in order to ease an emotional problem.

This kind of set-up in industrial psychiatry is too near paternalism to make me feel comfortable; for I am strongly "agin" paternalism in business, or government, or anywhere else except in the home, and then only up to adulthood. Paternalism is bad both for worker and for management, because it is against the inherent dignity of man. I am not against bigger and better holidays, or against bigger and better things for everybody. But I have reached the conclusion—from a not inconsiderable experience—that we are actually living in a world of struggle; and if we acknowledge that fact, we must also acknowledge certain fundamental premises in human relationships.

One of those premises involves the idea that life is not a bed of roses. It is a kind of game—and a tough one at that. There are people who consider it to be a game like bridge, played in a comfortable parlor in which the players nod to each other amiably, saying "May I play a heart, partner?" To which they receive the response, "Pray do."

Most of us realize, however, that life is more like a football game, and that we are liable to get a boot where the back forms a sort of mound, and be commanded to get up into the line and carry the ball! And I doubt whether any group of people have taken the hurdles of life better than those raised on "football techniques"; certainly, few have enjoyed the game more. So I believe that we should train our people to survive in a world of struggle, and not overprotect them to the point where we deprive them of the strength that is their rightful heritage, and that can be gained only through the development of moral, intellectual, and social muscles.

Actually, there is no fundamental difference between dealing with children and dealing with adults; both must be given a chance to stand on their own feet and to fight their own battles. For that reason, if for no other, industry should keep out of the private emotional problems of employees. When such problems do arise with individual workers, they should be handled on a man-to-man basis through an individual approach—never as an organizational policy, or through an employer's bureau.

If the emotional problem is related to the job, or has a specific relationship to other workers or to the industry, it is the job of the management to delve into the circumstances and find the cure. But if the problem arises out of community or domestic relationships, industry would do well not to step in except on invitation from the worker, and then only on an unofficial and co-worker basis, advising and helping as a good citizen of the community might advise and help another good citizen. In other words, dealing with the emotional problems that arise out of community or domestic relationship should not be considered by the employer as a formal function of industry.

INDUSTRY must get away from all "welfare aura." No one can buy a man's emotions with welfare work. Attempts to do so are like trying to bring up children on lollypop-reward basis—they will all want bigger and better lollypops. This does not imply that industry should ignore the basic drives of a man for the psychological and social factors necessary to a productive life which I mentioned earlier; it means that the things that have to be done should be so handled that men will better understand the members of their "team," and will be enabled to make a better producing

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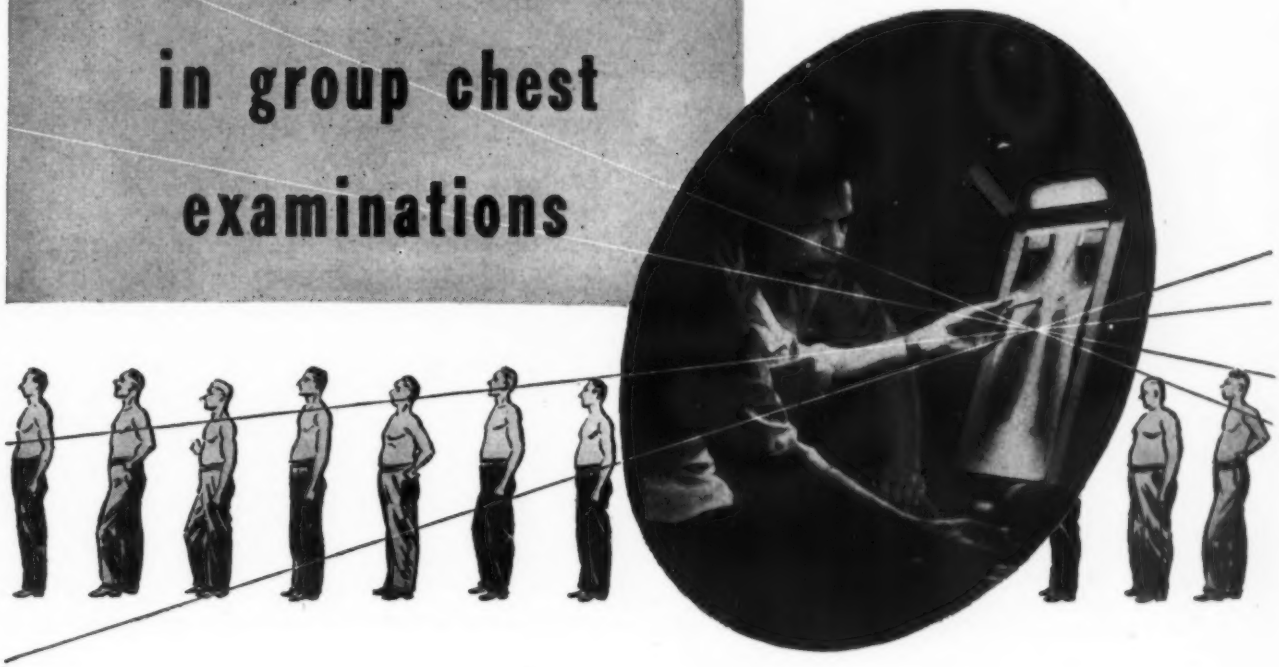

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team. Such things cannot be done even indirectly as a means of buying good will or morale—which are not "buyable."

Any permanency in the development of constructive emotional drives among workers is based upon employment justice, which must be so clearly expressed that the man on the street will be able to understand it readily.

The war has shown us that we can produce at capacity for an almost indefinite time. Industry has been able to mobilize its workers for sustained, concentrated work over a period of increasingly long hours. American patriotism, to be sure, has been one source of motivation—but there is another source, equally potent. War workers have met long hours, difficult housing conditions, food shortages, and other major obstacles to morale and have continued to carry the ball *because the purpose of industry has become the purpose of the worker; he has associated himself with the process and considers himself essential to the total effort.*

Here lies the answer to our major industrial problems. The future of our way of life depends upon the continuation of full production on a sustained basis now and after the war, and industry must take the lead in giving its people that conception and, with it, a vision of what the industrial team has as an objective.

There is no use in trying to solve the problem through a group of phrases and catchwords such as "labor management," "partnership in industry," "profit-sharing methods," etc. It is the fact that counts. If the war has taught us anything, it has taught us that *the forces that have brought management and labor together* have been enlightened mutual self-interest. *The cement that has held them together* has been a mutual understanding of the aims, objectives, and goals of the particular industry. *The drive that has sustained production* has been a worth-while goal which the worker could see and was interested in reaching.

The industry of the future, to be successful, will be merely a continuation along these same lines, with the emotional drive of winning the war replaced by appropriate peace-time objectives which will seem worth while in the eyes of the worker. It will not be sufficient to return to buying a man's time at so much an hour to do so much work in a mechanical, unimaginative way; in the postwar period, a man is going to want to know what the industrial team's objectives are, and why. I do not believe I am romanticizing when I say that he is increasingly going to want to know what his particular industry is trying to do, and he will be increasingly restive if he is merely told to "do that" or "do this."

There should be none of the "welfare idea" in such a policy; it should be based squarely on human drives for psychological and social, as well as economic, needs. If psychiatry has taught us anything, it is the fact that there are no lines of demarcation separating a man's various emotional desires. Industry's actual job, of course, is to see that his vocational urges are met, but that need is inexorably bound up with others, and unless the worker sees purpose and essential service in the job he is doing, agitation and unrest will follow. The progress of industry will be determined by our ability to preserve the individual while adjusting him to the central effort.

TWENTY-FIVE years ago, I said that "the man who comes along and finds a way *to complicate* industrial tasks so as to use more of the worker's capacity without reducing production will make a great contribution to both worker and management." And I repeat that statement with added emphasis today. Monotony, coupled with the failure to absorb a man's capacities, and the inability of the man to comprehend industry's goals are dangerous factors in any industry.

In the days of the artisans, there was a direct incentive "to get out production." The worker took pride in his own craftsmanship and struggled of his own free will to make his cabinet, or his shoes, or his table the finest that could be made. The development of the assembly-line technique has brought a sense of frustration

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to many workers which has been a potent factor of unrest.

In this regard, an interesting experiment is now under way in one of the country's great industrial plants. In connection with an experimental rehabilitation program, this management is instigating trial methods in machine training. In this project, visual performance charts have been pictorially designed to show how each screw and bolt made in the assembly line fits into the final product. The new worker, viewing these charts before starting his first machine experience and referring to them as he proceeds, is thus made aware of the essential significance of each seemingly isolated procedure. Certainly this is a step in the direction of giving purpose and interest to assembly-line work, and the results of such experiments may prove highly valuable to increased production.

I refer to an orderly presentation as part of a training program that is something over and above the practice of showing the worker a complete typewriter, or a complete bomber, or any other finished product, with no real education to orient him in the production scheme.

In the type of program to which I refer, the trainee is given sufficient knowledge of the other steps and processes so that he can see opportunities for his own orderly progression to higher and higher responsibilities in the industrial team. This is done with the implication that, within practical limitations, his own abilities and his own ambitions determine his own future.

The psychological soundness of such an idea is that a man is given incentive to go ahead—he is incentive-driven to develop his own resources for the ultimate profit both of himself and of industry. Through such an effort as this, industry can make a man feel as important as he really is because industry will have the means of letting him become as important as he is capable of being.

Experiments in present-day industry extend to other psychological factors as well—for example, in the use of color on machines and work tables. In one large industrial plant, machines employ five or six different colors—such as red for the handles that start the machinery, blue for those that stop it, and so on. On work tables, designs of various colors and shapes are employed on those parts on which the precision work is done. All of these studies that industry is carrying out seem to be a step in the right direction of understanding and utilizing the basic drives in human nature for the ultimate good of all through making the job more interesting and a bit more inspiring.

To sum up, I would stress the fact that emotional attitudes of employees toward their employment are responsible for a greater loss in dollars and cents in industry than are accidents and contagion, and that dissatisfaction and poor morale are due not so much to the employee's inability to do the job as to his inability to adjust himself to the conditions under which he must do it.

I would also repeat the statement that the function of psychiatry in industry is to seek out and correct those symptoms of maladjustment in order to save the employee in the broader interests of industry and progress; but that this neuropsychiatric service would best remain a role unheralded, although actually it will constitute an irreplaceable service to industry.

General principles to follow in the interest of mental health, as I have stated them, are the avoidance of paternalism, a hands-off policy regarding the employee's private and family problems, reduction of the "welfare aura," and the development in its place of a clearer understanding of the individual's need for psychological and social, as well as economic, satisfactions in his relation to his employment. We will be able to meet those needs, and at the same time increase production, when our workers become incentive-driven through realizing the mutual aims of workers and management.

Whatever means industry may use in following such principles, it cannot fail if in the end it succeeds in making the purpose of industry the purpose of the worker, so that the worker associates himself with the process and considers himself essential to the total effort. If industry can do that, then I will amend the old adage: "You can drive a horse to water—and even make him drink!"

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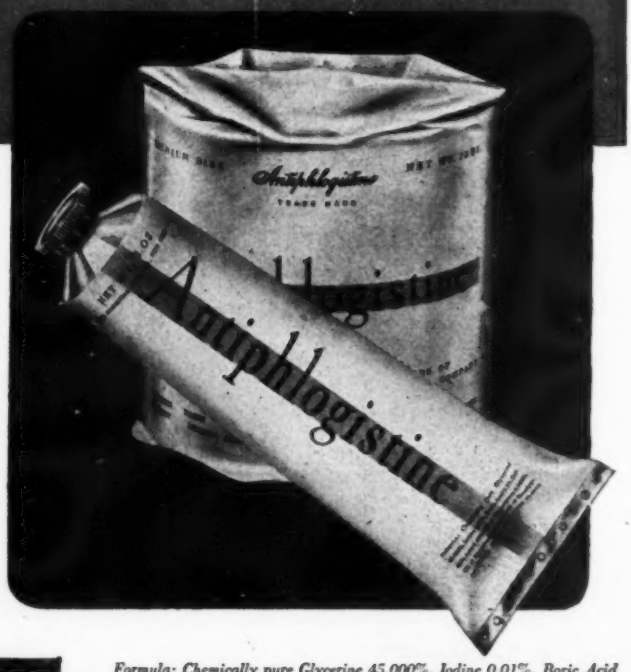

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COMMENT and OPINION

Industry Needs Medicine

PLANT 1 of the Eastern Aircraft Division of General Motors Corporation is located at Tarrytown, New York. Recently the Westchester County Medical Society was invited to hold its regular monthly meeting at this plant. Two hundred and fifty members attended a most interesting session. Events included a tour of the plant, inspection of the facilities and methods employed in the medical department, and dinner in the plant cafeteria. During the formal program later a film on industrial hygiene was shown. The plant medical director described relations with the medical profession, and the chief medical consultant to the corporation described medicine's contribution to the war effort in terms of maintaining industrial manpower in good health and on the job. Here intelligent industrial management demonstrated its need for medical service. This medical requirement can and should be part of the fabric of community medical service and planning. The physicians of Westchester County realize better than before that conflict does not exist between the proper objectives of industrial medicine and the best interests of their patients. The Council on Industrial Health feels that improved standards of industrial medicine depend largely on local medical organization, education and leadership expressed through committees on industrial health in state and county medical societies. The results in Westchester County indicate that opportunity awaits mutual understanding and instruction between industry and the allied professions of medicine, dentistry, engineering and nursing.

—Current Comment, in *J.A.M.A.*, May 26, 1945.

The Epileptic in Industry

APPROXIMATELY a third of a million American men and women of working age are subject to seizures. Probably a quarter of a million of these are fully able to work, but many are deprived of this privilege and the nation is deprived of their labor. The reasons are public prejudice and laws regarding compensation. Statement that the great majority of non-institutionalized epileptics are fully capable of productive work is supported by information concerning more than a thousand private or clinic patients questioned and examined by neurologists throughout the country. Examination disclosed that the vital organs and the musculature of these patients were as sound as in any unselected sample of the population; approximately 90% had normal muscular strength and control, and in only 9% was there gross mental deterioration. At the time of examination only 21% were listed as unable to work, and of these, 85% blamed seizures for the disability. Of those who reported they were fully able to work, 88% were employed at the time of the survey. As for occupations, 14% of the men were clergymen, dentists, engineers, lawyers, teachers, or physicians. Most frequently-named occupations were salesmen, 14%; farmers, 13%; clerks, 10%; laborers, 10%, and mechanics, 6%. Many patients were employed in positions in which a sudden loss of consciousness would endanger life or property. For epileptics, as for healthy persons, the proportion of accidental fatalities which are occupational is a rough indication of the degree of danger in a given employment. Among industrial policy holders of the Metropolitan Life Insurance Company only 24% of deaths due to accident occurred when the workman was "on the job." The proportion was lowest (1.8%) for clothing-workers, and rose progressively for waiters, shoe and cotton mill operators, store clerks, hotel servants, office assistants, automobile factory operators (the last 6%), farm and unskilled laborers (22%), mechanics (28%), chauffeurs (44%), structural iron workers (67%) and electric light and power linemen (86%).

—WILLIAM G. LENNOX, in *California & West. Med.*, 62: 9, January, 1945; abstr. in Lippincott's *Digest of Treatment*, May, 1945.

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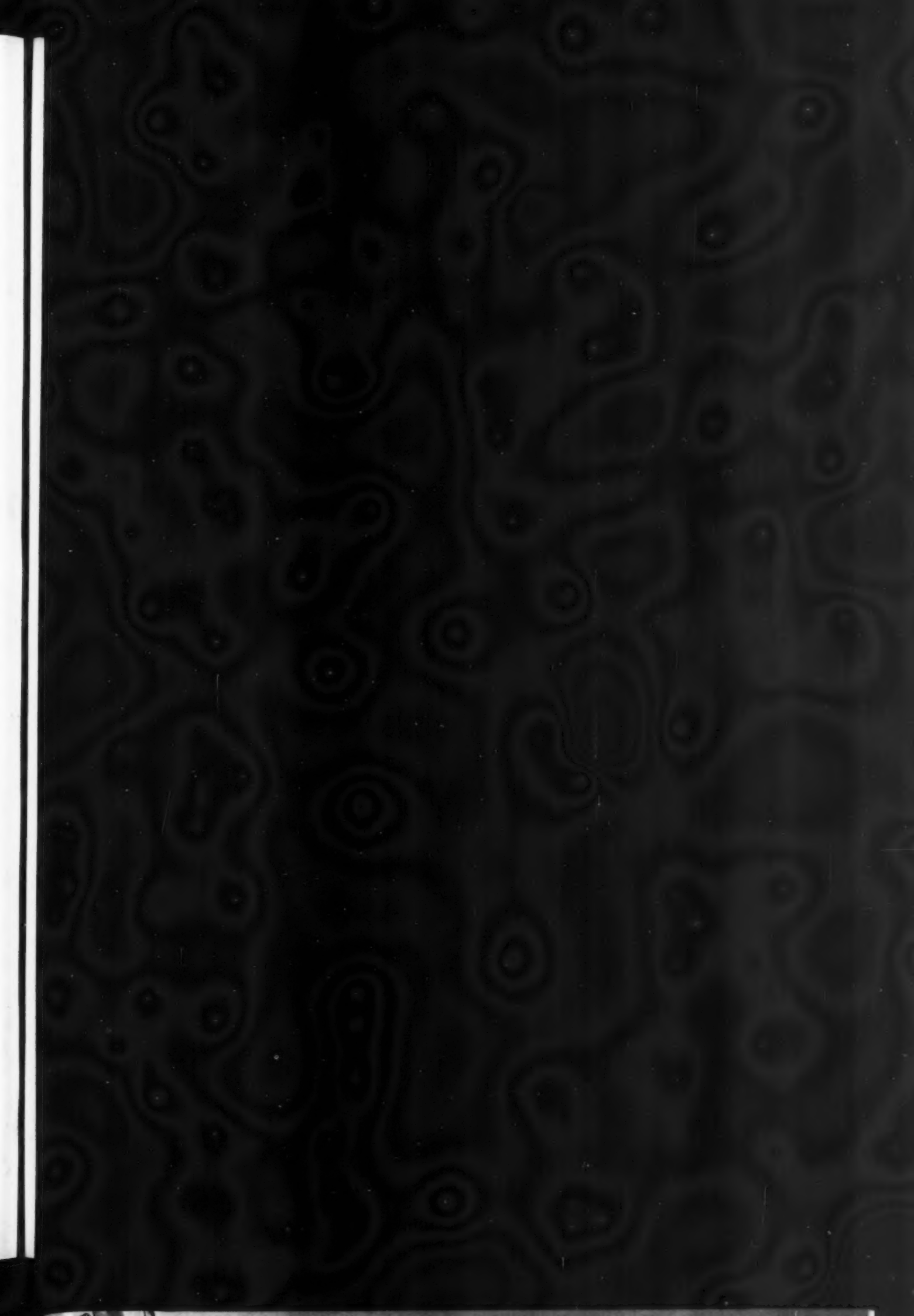
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